# Governor's Budget
# State of Montana
## Fiscal Years 2004-2005

**Judy Martz**
**Governor**



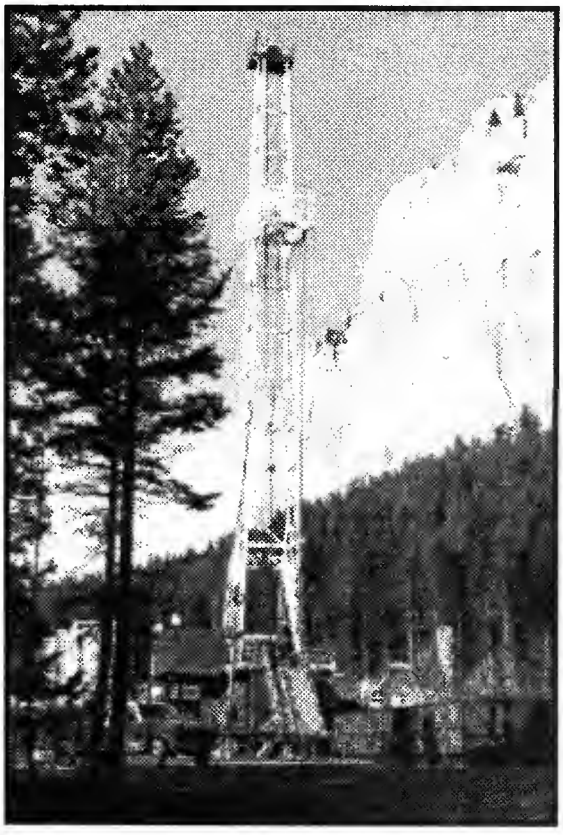

Photo courtesy the Montana Board of Oil and Gas Conservation

**RECLAMATION AND DEVELOPMENT GRANTS PROGRAM**

**January 2003**

**Project Evaluations and Funding Recommendations**

Volume 5

# RECLAMATION AND DEVELOPMENT GRANTS PROGRAM

# REPORT TO THE LEGISLATURE

## Project Evaluations and Funding Recommendations

January 2003

Montana Department of Natural Resources and Conservation
Conservation and Resource Development Division
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## ABBREVIATIONS

| | |
|---|---|
| AMD | acid mine drainage |
| ARARS | applicable and relevant and appropriate requirements |
| ARCO | Atlantic Richfield Company |
| AST | aboveground storage tank |
| BLM | Bureau of Land Management, U.S. Department of the Interior |
| BMP | best management practice |
| BOGC | Montana Board of Oil and Gas Conservation |
| CBM | coal bed methane |
| CD | conservation district |
| CECRA | Comprehensive Environmental Cleanup and Responsibility Act of 1989 |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act of 1980 |
| CGA | controlled groundwater area |
| $CO_2$ | carbon dioxide |
| CRK | C.R. Kendall Corporation |
| CSU | cabon sequestration unit |
| Cy | cubic yards |
| DATC | development of acid-tolerant cultivars |
| DEQ | Montana Department of Environmental Quality |
| DFWP | Montana Department of Fish, Wildlife and Parks |
| DOE | U.S. Department of Energy |
| DNRC | Montana Department of Natural Resources and Conservation |
| ECA | Environmental Contingency Account |
| EDA | Economic Development Administration |
| EEE/CA | Expanded Engineering Evaluation/Cost Analysis |
| EIS | environmental impact statement |
| EPA | U.S. Environmental Protection Agency |
| FY | fiscal year |
| GIS | geographic information system |
| GWIC | Groundwater Information Center, Montana Bureau of Mines and Geology |
| MBMG | Montana Bureau of Mines and Geology |
| MCA | *Montana Code Annotated* |
| MCOC | Montana Carbon Offset Coalition |
| MDT | Montana Department of Transportation |
| MEPA | Montana Environmental Policy Act |
| mg/kg | milligrams per kilogram |
| MSR | microbial sulfate reduction |
| MSU | Montana State University |
| MWCB | Mine Waste Cleanup Bureau |
| MWTP | Mine Waste Technology Program |
| NCP | National Contingency Plan |
| NCOC | National Carbon Offset Coalition |
| NEPA | National Environmental Policy Act |
| NRCS | Natural Resources Conservation Service, U.S. Department of Agriculture |
| PA | Preliminary Assessment |
| PLPs | potentially responsible persons |
| PRB | Powder River Basin |
| RBSL | risk-based screening level |
| RC&D | Resource Conservation and Development Area |
| RDGP | Reclamation and Development Grants Program |
| RIT | Resource Indemnity Trust |
| SFM | Sustainable Forestry Management |

| | |
|---|---|
| TAC | technical advisory committee |
| TCF | trillion cubic feet |
| TDS | total dissolved solids |
| USDA | U.S. Department of Agriculture |
| USFS | U.S. Forest Service |
| USFWS | U.S. Fish and Wildlife Service |
| USGS | U.S. Geological Survey |
| VOC | volatile organic compounds |
| WPPS | Well Plugging Prioritization System |

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## PROJECTS SUBMITTED FOR FUNDING IN THE 2005 BIENNIUM

Following is a list of projects submitted for funding in the 2005 biennium. For easy reference, the list is alphabetized by the names of the project sponsors. However, in Chapter II the project abstracts, assessments, and recommendations are presented in the order of their ranking by the Department of Natural Resources and Conservation and the Governor.

**APPLICANT NAME – Project Title** **Page**

* The Montana Department of Environmental Quality – Williams Clay Pit Reclamation application was withdrawn prior to DNRC ranking.

# CHAPTER I

# PROGRAM DESCRIPTION AND PROCEDURES

## Program Information

The Reclamation and Development Grants Program (RDGP) is a state-funded grant program designed to fund projects that *"indemnify the people of the state for the effects of mineral development on public resources and that meet other crucial state needs serving the public interest and the total environment of the citizens of Montana"* (90-2-1102, MCA). The program, established by the 1987 Montana Legislature, is administered by the Montana Department of Natural Resources and Conservation (DNRC).

In December 2001, DNRC mailed application materials to all Montana communities, counties, the university system, conservation districts, state agencies, state legislators, and others who might benefit by program participation. The application deadline was May 15, 2002. DNRC received 26 applications for RDGP funding totaling nearly $7.3 million. These projects are listed alphabetically by applicant on pages iii and iv.

The funding source for this program is the interest income from the resource indemnity trust (RIT) fund. This fund, established by 15-38-201, MCA, receives proceeds from taxes levied on mineral production. Since 1986, 175 projects totaling more than $31 million have been authorized for funding by previous legislatures. The 1993 Legislature directed that, beginning in state fiscal year (FY) 1996, a minimum of $3 million be allocated for grants. In 1993, the legislature also directed DNRC to give priority to grant requests from the Montana Board of Oil and Gas Conservation (BOGC). This priority is not to exceed $600,000 for the biennium and does not preclude BOGC from submitting additional grant requests. Additional BOGC grant requests are received and ranked by DNRC in the same manner as all other grant requests submitted.

The Reclamation and Development Grants Program Act requires that the Governor submit, by the first day of each regular session of the legislature, a list of all grant proposals received with his or her recommended priorities for funding (see Table 1). Administrative rules further provide that DNRC must furnish to the legislature a status report on previously funded projects, which is here provided in Chapter III. This report is the result of those directives.

## Project Eligibility

The following excerpt from the Reclamation and Development Grants Program Act (90-2-1112, MCA) establishes criteria that projects must meet in order to be eligible for funding.

1. *Except as provided under subsection (2), to be eligible for funding under the Reclamation and Development Grants Program, the proposed project must provide benefits in one or more of the following categories:*

    a. *Reclamation of land, water, or other resources adversely affected by mineral development*
    b. *Mitigation of damage to public resources caused by mineral development*
    c. *Research, demonstration, or technical assistance to promote the wise use of Montana minerals, including efforts to make processing more environmentally compatible*
    d. *Investigation and remediation of sites where hazardous wastes or regulated substances threaten public health or the environment, and*
    e. *Research to assess existing or potential environmental damage resulting from mineral development.*

2. *If there is a crucial state need to protect Montana's environment, the department may evaluate and the governor may recommend that the legislature approve funding for projects in addition to those described in subsection (1).*

## Applicant Eligibility

Any department, agency, board, commission, or other division of state government or any city, county, or other political subdivision or tribal government within the state may apply for a grant from the Reclamation and Development Grants Program.

## Funding Limits

No grant may exceed $300,000. An applicant proposing more than one project may submit a separate application for each. There is no minimum funding limit.

## Application Review and Ranking Procedures

The grant applications were evaluated for the technical and financial feasibility of the proposed projects, public benefits to be provided, need and urgency, and impacts on the environment. Reviewers included staff members of the Conservation and Resource Development Division of DNRC and federal, state, and university personnel having expertise in specific project areas. For each application, a descriptive project assessment was written incorporating the concerns, ideas, and comments of the project reviewers.

More funds are requested than are available. Therefore, the department ranks feasible projects, so that it can recommend funding priority and funding level to the Governor and the legislature. Evaluation criteria established by the 1987 Legislature include, but are not limited to:

1. The degree to which the project will provide benefits in its eligibility category or categories
2. The degree to which the project will provide public benefits
3. The degree to which the project will promote, enhance, or advance the policies and purposes of the Reclamation and Development Grants Program
4. The degree to which the project will provide for the conservation of natural resources
5. The degree of need and urgency for the project
6. The extent to which the project sponsor or local entity is contributing to the costs of the project or is generating additional non-state funds
7. The degree to which jobs are created for persons who need job training, receive public assistance, or are chronically unemployed
8. Any other criteria DNRC considers necessary to carry out the policies and purposes of the Reclamation and Development Grants Program

Under the ranking system, a proposal could receive a maximum of 215 points. Specific criteria were established for each category to provide consistency. Of the following criteria, public benefits and need and urgency were weighted most heavily.

| | Maximum Points Possible |
|---|---|
| 1. Public benefits | 90 |
| 2 Need and urgency | 50 |
| 3. Appropriateness of technical design | 40 |
| 4. Financial feasibility | 15 |
| 5. Project management organization | 20 |
| **Total possible points:** | **215** |

## Recommendations

After ranking the projects and recommending funding, the Conservation and Resource Development Division made its recommendations to the DNRC director. The director then presented the recommendations by DNRC to the Governor. The final ranking of the proposed projects is presented in Table 1, along with funding recommendations.

An appropriations bill listing the Governor's recommendations will be introduced to the 2003 Legislature. By appropriation or other means, the legislature may approve grants for those projects it finds consistent with the policies and purposes of RDGP.

## TABLE 1

## RANKING AND FUNDING RECOMMENDATIONS

| Rank | Project Sponsor / Project Name | Amount Requested | Amount Recommended | Cumulative Total Recommended |
|---|---|---|---|---|
| 1 | **Montana Board of Oil and Gas Conservation**<br>2003 Northern District Plug and Abandonment, and Site Restoration | $ 300,000 | $ 300,000 | $ 300,000 |
| 2 | **Montana Board of Oil and Gas Conservation**<br>2003 Southern District Plug and Abandonment, and Site Restoration | 300,000 | 300,000 | 600,000 |
| * 3 | **Montana Department of Natural Resources and Conservation**<br>Planning Grants | 150,000 | 150,000 | 750,000 |
| 4 | **Montana Department of Environmental Quality**<br>Washington Mine and Mill Reclamation | 300,000 | 300,000 | 1,050,000 |
| 5 | **Big Horn Conservation District**<br>State-Line Groundwater Monitoring Network For Tongue And Powder River Watersheds | 300,000 | 300,000 | 1,350,000 |
| 6 | **Sunburst, Town of**<br>Sunburst Water Supply Renovation | 185,249 | 185,249 | 1,535,249 |
| 7 | **Montana Board of Oil and Gas Conservation**<br>Fate and Transport of Impounded Coal Bed Methane Water | 200,000 | 200,000 | 1,735,249 |
| 8 | **Montana Department of Environmental Quality**<br>Drumlummon Tailings, Goldsil - Argo Millsite and Mine Waste Reclamation | 300,000 | 300,000 | 2,035,249 |
| 9 | **Toole County**<br>2003 Plugging and Abandonment Aid To Small Independent Oil Operators | 300,000 | 240,000 | 2,275,249 |
| 10 | **Montana Department of Environmental Quality**<br>Bluebird Mine Reclamation | 300,000 | 200,000 | 2,475,249 |
| 11 | **Sheridan County Conservation District**<br>Protecting Natural Resources By Reclaiming Oil-Field Brine-Contaminated Soils | 299,950 | 150,000 | 2,625,249 |
| 12 | **Governor's Office of Economic Opportunity**<br>Growing Carbon: "Applying Market-Based Conservation Through Carbon Sequestration" | 300,000 | 150,000 | 2,775,249 |
| 13 | **Fergus County Conservation District**<br>Central Montana Aquifer | 299,500 | 150,000 | 2,925,249 |
| 14 | **Judith Basin Conservation District**<br>Judith Basin Aquifer Restoration and Conservation | 300,000 | 70,000 | 2,995,249 |
| | **TOTAL** | **3,834,699** | **2,995,249** | |
| | **Projects Below This Line Were Not Recommended For Funding** | | | |
| | **Butte-Silver Bow Local Government**<br>Butte Native Plant Propagation Nursery | 167,337 | 0 | 2,995,249 |
| | **Butte-Silver Bow Local Government**<br>Excelsior Reclamation | 129,497 | 0 | 2,995,249 |
| | **Lewis and Clark County**<br>Cave Gulch Watershed Restoration | 300,000 | 0 | 2,995,249 |
| | **Montana Department of Environmental Quality**<br>Broadway / Victoria Mine Reclamation | 300,000 | 0 | 2,995,249 |

| Rank | Project Sponsor / Project Name | Amount Requested | Amount Recommended | Cumulative Total Recommended |
|---|---|---|---|---|
| | **Montana Department of Environmental Quality**<br>Browns Gulch Creek Restoration | 300,000 | 0 | 2,995,249 |
| | **Montana Department of Environmental Quality**<br>Former Equity Co-Op Bulk Plant | 300,000 | 0 | 2,995,249 |
| | **Montana Department of Environmental Quality**<br>Kendall / Hilger Area – Barnes / King Gulch Tailings Removal | 300,000 | 0 | 2,995,249 |
| | **Montana Department of Environmental Quality**<br>MTS Tire Recyclers Cleanup | 300,000* | 0 | 2,995,249 |
| | **Powell County**<br>CMC Roundhouse Site Cleanup | 276,450 | 0 | 2,995,249 |
| | **Powell County**<br>Kimball Mine Complex Reclamation | 300,000 | 0 | 2,995,249 |
| | **University of Montana**<br>Recovery of Metals and Remediation of Hazardous Mine Wastes | 300,000 | 0 | 2,995,249 |
| | **Whitefish, City of**<br>Reclamation of Pre-1971 Opencut Mining Disturbance in Whitefish Gravel Pit | 300,000 | 0 | 2,995,249 |
| | **** TOTAL** | **$7,107,983** | **$2,995,249** | |

* Not an application; DNRC will propose Planning Grant funding recommendation directly to the legislature

** The Montana Department of Environmental Quality – Williams Clay Pit Reclamation application was withdrawn prior to DNRC ranking, and is not included in this total.

## CHAPTER II

## PROJECT ABSTRACTS, EVALUATIONS, AND RECOMMENDATIONS FOR THE 2005 BIENNIUM

These evaluations are based on review of the projects by DNRC. The first 14 evaluations of recommended projects are presented in the order of their ranking. Of the $2,995,249 recommended for these projects, a statutory maximum of $3.0 million may be awarded by the 2003 Legislature. To find any particular evaluation quickly, simply consult the alphabetical listing of projects by the name of the applicant on pages iii and iv.

For projects recommended for RDGP funding, "TOTAL PROJECT COST" is the sum of "OTHER FUNDING SOURCES" plus the AMOUNT RECOMMENDED.

## Part I. Projects Recommended for Funding

**Project Nos. 1 & 2**

| | |
|---|---|
| **Applicant Name** | Montana Board of Oil and Gas Conservation |
| **Project Names** | 2003 Northern District Orphaned Well Plug and Abandonment, and Site Restoration<br>and<br>2003 Southern District Orphaned Well Plug and Abandonment, and Site Restoration |
| **Amount Requested** | $ 600,000 |
| **Other Funding Sources** | $ 41,084 Applicant |
| **Total Project Cost** | $ 641,084 |
| **Amount Recommended** | $ 600,000 |

**Project Abstract** (prepared and submitted by applicant)

The purpose of this grant request is to secure funding to properly plug and abandon orphaned oil and gas and leaking orphaned abandoned wells, and to perform the surface reclamation. The wells are of no further economic use and have the potential to cause damage to subsurface formations, the state's water, and the surface around each well.

The Board of Oil and Gas Conservation (BOGC) will eliminate the threat of contamination by soliciting bids to plug and abandon the wells. Under the supervision of the BOGC staff, the successful bidder will properly plug and abandon each well, dispose of and/or remediate contaminants, and reclaim the surface location.

The wells produced oil and gas or were plugged in the past. The operators could no longer afford to produce the wells, and the wells were shut in. The companies' assets will not cover the liabilities to creditors, leaving the operators insolvent. Since the operators are currently insolvent or long since defunct, responsibility for the wells and any potential environmental damage rests with BOGC and the State of Montana. The wells will be properly plugged and abandoned when funding is made available.

The orphaned wells are located throughout Montana. The list of orphaned wells is prioritized, and in most cases, the wells that present the highest potential to damage the environment because of leaking or loss of mechanical integrity will be plugged first.

The project is estimated to take 24 months. The work will generally begin during the first suitable field season following the availability of funding.

**Technical Assessment**

The priority and funding amount for BOGC applications, 2003 Northern District and 2003 Southern District, are established pursuant to 90-2-1113(2) (a-c), MCA. For reference, this statute states:

> *(2)(a) Subject to the conditions of this part, the department shall give priority to grant requests, not to exceed a total of $600,000 for the biennium, from the Board of Oil and Gas Conservation. The Board of Oil and Gas Conservation shall use a grant that received priority under this subsection (2)(a) for oil and gas reclamation projects. The board may use a maximum of 2.5% of the amount of a grant for administrative costs associated with implementing the projects covered in the grant.*

(b) *Any unobligated fund balance of a grant that received priority under subsection (2)(a) remaining at the end of the current biennium must be included as part of the $600,000 limitation for the next biennium.*

(c) *The priority given to the Board of Oil and Gas Conservation under subsection (2)(a) does not preclude the Board of Oil and Gas Conservation from submitting additional grant requests. The department shall evaluate additional grant requests from the Board of Oil and Gas Conservation in accordance with the provisions of subsection (1).*

These two applications represent 29 wells located in Toole (13 wells), Glacier (4 wells), Stillwater (4 wells), Musselshell (3 wells), Yellowstone (2 wells), Pondera (1 well), Teton (1 well) and Wheatland (1 well) Counties. All of the wells have been evaluated using Montana's Well Plugging Prioritization System (WPPS). WPPS rates such factors as the threat the well poses to groundwater and surface water, mechanical condition of the wellhead casing, public safety, and potential for cross contamination of mineral-bearing formations and aquifers. All of these wells are leaking some combination of oil, gas, and/or water to the ground surface. Delays in proper plugging and abandonment of these wells will result in continued threats to the environment and increased future costs.

The wells are abandoned, and all attempts by BOGC to hold a party responsible for plugging these wells have been unsuccessful. The plugging of these wells involves standard oil-field equipment and procedures and will be performed by qualified oil-field plugging contractors.

**Financial Assessment**

The two RDGP grant applications are for $300,000 each. Totals for major budget categories and matching contributions are as follows:

| | RDGP | Matching Funds | Total |
|---|---|---|---|
| Salaries and Wages | $ 0 | $ 23,779 | $ 23,779 |
| Employee Benefits | $ 0 | $ 6,163 | $ 6,163 |
| Contracted Services | $ 600,000 | $ 0 | $ 600,000 |
| Supplies and Materials | $ 0 | $ 1,000 | $ 1,000 |
| Communications | $ 0 | $ 504 | $ 504 |
| Travel | $ 0 | $ 9,638 | $ 9,638 |
| **Total** | **$ 600,000** | **$ 41,084** | **$ 641,084** |

Cost estimates are based on bids on past projects contracted by BOGC and are reasonable for the work performed. As with any oil- and- gas-plugging project, unknown or unforeseen circumstances may be encountered underground, and costs may vary considerably.

The 2003 Northern and the 2003 Southern applications constitute the BOGC $600,000 priority allocation for the 2005 biennium. At the time of this review, there is $600,000 remaining in the applicant's 2003 biennium priority allocation.

**Environmental Evaluation**

No long-term adverse environmental impacts should be created in the plugging and abandonment of the proposed wells, provided reclamation activities are conducted properly. Short-term adverse impacts associated with the movement of equipment to the sites are expected. Compacted soil and destroyed vegetation on access routes would be reclaimed upon project completion, and any debris would be hauled off-site and disposed of in a licensed landfill. Short-term air pollution (e.g., dust, emissions from combustion engines) would be minimal, provided that equipment and traffic routes are watered as necessary and mechanized equipment is in proper working condition. If the sites involve cleanup and disposal of drilling fluids, oil sludge, brine wastes, or other contaminants, these materials must be identified and characterized, and this information must be used to develop site-specific reclamation plans. Depending on the material and contaminants encountered, remedial action may involve burning, burial, land farming, and addition of soil amendments for materials disposed of on-site, or it may

involve hauling materials to a licensed off-site landfill or waste disposal facility. If disposal poses unusual difficulty or necessitates remedial actions not normally implemented by the board, appropriate regulatory or reclamation experts would need to be contacted.

**Public Benefits Assessment**

The proper plugging and abandonment of these wells benefit all Montanans by eliminating severe impacts to groundwater and surface water caused by oil-field development activity. Statewide, many abandoned and unplugged wells threaten water supplies used for drinking water, stock watering, and irrigation purposes. Safety hazards (e.g., open holes, gas emissions, blowout potential) affect not only humans, but also stock and wildlife. Proper plugging eliminates site-specific problems and helps ensure long-term protection of soil, water, and vegetative resources. Moderate economic benefit will be realized by contractors, equipment suppliers, and other area retailers.

**Recommendation**

A grant of up to $600,000 is recommended for the 2003 Northern and 2003 Southern District projects, contingent upon DNRC approval of the project scope of work and budget. Any amount remaining from the Board of Oil and Gas Conservation's 2003 biennium priority allocation must be counted against the priority allocation for the biennium beginning July 1, 2003.

**Project No. 3**

| | | |
|---|---|---|
| **Applicant Name** | Montana Department of Environmental Quality | |
| **Project Name** | Washington Mine and Mill Reclamation | |
| **Amount Requested** | $ 300,000 | |
| **Other Funding Sources** | $ 1,468,000 | Applicant |
| **Total Project Cost** | $ 1,768,000 | |
| **Amount Recommended** | $ 300,000 | |

**Project Abstract** (prepared and submitted by applicant)

The purpose of this project is to address human health and safety hazards associated with exposed and accessible heavy metals and acid mine drainage originating from the Washington Mine and Mill tailings. The Washington Mine and Mill site contains 106,400 cubic yards of waste rock and 30,600 cubic yards of mill tailings that are currently deposited in the Deer Creek drainage and eroding into Spring Creek and, ultimately, Prickly Pear Creek. Eroded tailings are visible along the Deer Creek stream bank for a distance of 2,500 feet below the mill site, and dissolved metals and acid water can be detected 3 miles downstream at the confluence of Deer Creek and Spring Creek. The site wastes contain significantly elevated levels of arsenic, lead, and manganese. Site surface water and groundwater degradation have been documented. Site water sampling clearly indicates contaminant migration off-site. Contaminated soil and waste have affected trees, grass, and shrubs; much of this vegetation has succumbed to heavy metal poisoning and acidity. The Washington Mine ranks at 3 of 270 sites as evaluated in the "Abandoned Hardrock Mine Priority Sites."

The primary objectives of this project are to (1) remove solid media contaminant sources located at the Washington Mine and Mill site and those materials that have eroded into Deer Creek, and (2) dispose of these wastes in a constructed repository. Site surface water would be isolated from contact with contaminated mine and mill wastes, and all disturbed areas would be regraded, topsoiled, and revegetated. When the above tasks are completed, heavy metals exposure and migration would be significantly reduced or eliminated. Water quality would be improved, and the site and lower stream areas would again be able to support a native stand of vegetation species.

The DEQ Mine Waste Cleanup Bureau (MWCB) would be the organization responsible for conducting this reclamation project.

The Washington Mine is located approximately 2 miles west of the townsite of Wickes, Montana, in the Colorado Mining District, Jefferson County. Specifically, the Washington Mine occupies approximately 10 acres in the headwaters of Deer Creek in Section 17, Township 7 North, Range 4 West.

All environmental and investigation tasks for this project have been completed. Engineering design, the bid package and the bidding process need to be completed and would require four to six months. Once construction is implemented, the project should be completed in 120 consecutive calendar days. Following construction, a final report would be completed in two months.

**Technical Assessment**

The reclamation process used by DEQ is designed to comply with the requirements of the National Oil and Hazardous Substances Contingency Plan; the Comprehensive Environmental Response, Compensation, and Liability Act; and the Montana Comprehensive Environmental Cleanup and Responsibility Act. Certain aspects of the process have been streamlined to meet the regulatory and functional needs of cleaning up relatively small abandoned mine sites that are generally situated in remote locations.

Although there has not been any mining activity on any of the properties since the 1950s, historical mining activities have left 106,400 cubic yards of waste rock; 30,600 cubic yards of tailings; and two adits discharging acid waters. The waste rock is located in the upper portions of the site, primarily above the mill buildings, and around the collapsed adits. Tailings materials have been deposited behind five earthen dams constructed within an 1,800-foot down-gradient portion of the Deer Creek drainage channel. The mill building wastes are located around and within the crusher and ball mill sites, flotation vats area, and ore bin and load-out facilities. Testing of the tailings revealed the following elements at concentrations at least three times their background levels: arsenic – 11,000 mg/kg; iron – 101,000 mg/kg; lead - 5,830 mg/kg; zinc – 10,700 mg/kg; cadmium - 68.9 mg/kg; and antinomy - 43 mg/kg. Testing of the waste rock revealed the following elements at concentrations exceeding three times their background levels: arsenic - 3,250 mg/kg; antinomy - 19 mg/kg; cadmium - 20.8 mg/kg; lead – 4,420 mg/kg; and zinc – 10,700 mg/kg. Three collapsed adits, two of which are discharging acid water, are associated with the Washington Mine. In both cases, the discharge exceeds acute and chronic aquatic life criteria for zinc, arsenic, and cadmium. Detailed information on all aspects of the site is available in the "Expanded Engineering Evaluation and Cost Analysis (EEE/CA) for the Washington Mine", which has been completed for this grant application.

The EEE/CA lists Reclamation Cleanup Alternative 4 as the one most likely to be implemented at the Washington Mine. This preferred alternative (considering available funds) involves containing the mine waste contaminants on-site including (1) consolidation and regrading of the mine wastes, (2) construction of an earthen cap with a geomembrane liner, (3) drainage design and control, and (4) revegetation of all disturbed areas. Removal of mine wastes to an off-site repository would be cost-prohibitive (more expensive by an estimated $406,266). Alternative 4 would effectively reclaim the entire site, would be easy to implement, would provide a high degree of protection to human health and the environment, and would be cost-effective.

DEQ's MWCB has a demonstrated history of completing mine reclamation projects in an effective and efficient manner. MWCB typically manages several mine reclamation projects per year, working in conjunction with engineering consultants, archeological consultants, surveyors, and other state and federal agencies in order to complete a project. The information submitted justifies priority ranking and funding at the $300,000 level.

**Financial Assessment**

The estimated project costs of $1,768,000 are based on anticipated site complexity, necessary engineering investigations and design, construction effort, material quantities, and expected construction difficulties. An administrative grant issued to DEQ by the U.S. Office of Surface Mining will provide for all costs of in-house personnel including salary, employee benefits, supplies, materials, communication, travel, rent, utilities, miscellaneous expenses, and indirect costs. A second project grant will provide for part of the costs associated

with engineering design and construction specific to the Washington Mine and Mill Reclamation Project. RDGP funding would be used to supplement the contracted construction costs specific to the Washington Mine and Mill Reclamation Project.

The total overall budget for this project consists of the following:

| | RDGP | Matching Funds | Total |
|---|---|---|---|
| Contracted Services | $300,000 | $1,468,000 | $1,768,000 |
| **Total** | **$300,000** | **$1,468,000** | **$1,768,000** |

**Environmental Evaluation**

It is anticipated that the construction phase of this project would be accomplished within one field season; therefore, impacts associated with construction would likely be short-term and minimal. These potential short-term impacts would be mitigated during the construction phase. On-site workers would be adequately protected by using appropriate personal protective equipment and by following proper operating and safety procedures. However, short-term air quality impacts to the surrounding environment may occur due to the relatively large volumes of waste requiring consolidation and grading. Control of fugitive dust emissions would be provided by applying water to surfaces receiving heavy vehicular traffic or in excavation areas, as needed. Short-term impacts to the surrounding community are expected to be minimal. A measurable short-term impact to the surrounding community would include increased vehicular traffic and associated safety hazards near Jefferson City, Corbin, and Wickes, Montana, in association with the construction. Dust generation may occur near Wickes, and water may have to be applied to the roads in the area.

**Public Benefits Assessment**

This project would address human health and safety risks associated with heavy metals contamination at the site. The project would eliminate the possibility of human contact with contaminated soils, waste rock, and tailings. The project would also reduce or eliminate the possibility of human contact with waterborne heavy metal contamination. Hazardous, unstable slopes; waste rock piles; and scattered tailings would be stabilized, and dangerous haul roads would be improved or eliminated. Dangerous mine openings would be closed.

Although the Washington Mine and Mill site is located on private patented claims, site contamination is migrating to public and private lands and water resources. The site is in close proximity to public lands administered by both the Bureau of Land Management and the Helena National Forest. Site contamination has eroded into Spring Creek, and water quality is degraded for a substantial length of the creek.

Reclamation of the Washington Mine and Mill site will significantly reduce or eliminate contamination migration off-site. This will have a positive impact on the Spring Creek watershed and ultimately Prickly Pear Creek, both of which are public resources.

**Recommendation**

A grant of up to $300,000 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

**Project No. 4**

| | |
|---|---|
| **Applicant Name** | Big Horn Conservation District |
| **Project Name** | State Line Groundwater Monitoring Network for the Tongue River and Powder River Watersheds |
| **Amount Requested** | $ 300,000 |
| **Other Funding Sources** | $ 12,000 Applicant |
| | $ 72,220 Montana Bureau of Mines and Geology (MBMG) |
| **Total Project Cost** | $ 384,220 |
| **Amount Recommended** | $ 300,000 |

**Project Abstract** (prepared and submitted by applicant)

Coal bed methane (CBM) production in southeastern Montana and northeastern Wyoming will be accomplished by pumping groundwater from coal bed aquifers for the life of gas production. This will significantly reduce the volume of groundwater that is normally available to wells, springs, coal mine reclamation, and stream base flow within this region of Montana. Surface discharge of CBM-produced water can severely impact agricultural practices, streams, alluvial aquifers, soils, and riparian areas. House Bill 572, from the 2001 legislative session, mandates that local conservation districts be able to evaluate these CBM development impacts to wells and springs and authorize appropriate financial compensation for damages to landowners. State and federal CBM permit decisions must be based on scientific data. Currently, however, there is no infrastructure in place to provide the scientific data required for such decision making.

The Goals for this project are to (1) complete the Montana groundwater monitoring network for CBM, started in 2002 under U.S. Bureau of Land Management (BLM) funding, by construction of nine groundwater monitoring sites along the Montana/Wyoming state line, (2) collect initial water level and water quality data at each site, and (3) make the data available to the public through the Montana Groundwater Information Center (GWIC).

The need for this network of monitoring wells has been identified by DNRC's Technical Advisory Committee for the Controlled Groundwater Basin. This group has specifically prioritized the proposed components of the network listed in this proposal as necessary for data collection. The complete network includes wells that are not included in this proposal, but are being installed under other programs. In the *Montana Statewide Draft Oil and Gas Environmental Impact Statement and Amendment of the Powder River and Billings Resource Management Plans* (Montana CBM EIS), the need for a state line monitoring network is specifically listed on page MON-10 and referred to in other parts of the document.

The project would be administered by the Big Horn Conservation District (CD), with technical services provided by MBMG. The anticipated life of the project is 24 months.

**Technical Assessment**

The subject proposal is for funding to establish groundwater monitoring sites and to conduct baseline water level and water quality monitoring at these sites. Monitoring sites would consist of wells and springs tapping coal aquifers targeted for CBM development as well as overlying sandstone and alluvial aquifers. Data collected from the proposed monitoring network would be used by various government entities to evaluate the effects of CBM development on water resources of the Powder River basin. The Technical Advisory Committee (TAC) for the Powder River Basin Controlled Groundwater Area (CGA) would use the data to fulfill its responsibility to review groundwater data periodically and report findings regarding the impact to groundwater resources from CBM activities. Big Horn CD and other conservation districts would use the data to help identify groundwater impacts of CBM development as provided in Title 76, Chapter 15, Part 9, MCA.

The major expenditure for the proposed project would be the construction of nine dedicated monitoring wells located along the Montana-Wyoming border and for associated field personnel expenses. Water samples would be collected and water levels measured during the term of the project to characterize pre-development

groundwater conditions. Lithologic information from well boreholes and well completion information would be made accessible to the public through the Groundwater Information Center database. Monitoring would continue after the term of the project under other funding.

Establishing monitoring sites on public land, installing dedicated monitoring wells, and conducting baseline monitoring directly address the goals and objectives of the proposed project. The proposed project actually is part of a larger monitoring effort that uses funding from BLM and the CBM industry.

The final products would be a network of wells and springs along the Wyoming-Montana border available to monitor the effects of CBM development on groundwater conditions, and a report detailing well construction and the results of two years of baseline monitoring. The monitoring network would provide necessary infrastructure for continued monitoring and, along with baseline monitoring data, make it possible to detect the effects of CBM development on groundwater resources.

Estimates of the number of CBM wells, their expected rates of water production, and the drawdown possible at the Wyoming-Montana border support the need and urgency of the proposal. Monitoring clearly needs to be initiated prior to major development in order to detect changes in groundwater conditions resulting from CBM development.

The project is directly responsive to needs for regional monitoring identified by the Technical Advisory Committee for the Powder River Basin CGA and published in the Montana CBM EIS. TAC includes representatives of the U.S. Geological Survey, BLM, DNRC, DEQ, and CBM industry.

A lack of information on baseline groundwater conditions and the effects of CBM development will limit the state's and industry's ability to predict and mitigate the effects of CBM production. The impacts to the agriculture industry and other water users in the Powder River basin could be significant if impacts go unabated or unmitigated. The ability of industry to manage CBM operations to mitigate impacts effectively may affect their success in effectively developing CBM.

According to the Montana CBM EIS, 2.9 billion gallons of water will be produced from groundwater annually as a by-product of producing methane from coal seams in the Montana portion of the Powder River Basin. An even greater amount of water will be produced from CBM fields on the Wyoming side of the basin. The coal seams targeted for CBM development constitute important regional aquifers that provide water for domestic, livestock, agriculture, and industrial uses. Groundwater model results presented in the *Wyoming Draft EIS and Draft Planning Amendment for the Powder River Basin Oil and Gas Project* indicate that water levels could decline 300 feet at the Montana-Wyoming border because of CBM production in Wyoming. The work described in the subject proposal would provide early detection of the effects of CBM development on groundwater and is crucial to the state's ability to understand impacts and initiate mitigation.

**Financial Assessment**

The total overall budget for this project consists of the following:

| | RDGP | Matching Funds | Total |
|---|---|---|---|
| Salaries and Wages | $ 33,314 | $ 33,510 | $ 66,824 |
| Employee Benefits | $ 11,383 | $ 11,729 | $ 23,112 |
| Contracted Services | $ 222,250 | $ 0 | $ 222,250 |
| Supplies and Materials | $ 3,019 | $ 0 | $ 3,019 |
| Communications | $ 100 | $ 0 | $ 100 |
| Travel | $ 10,715 | $ 0 | $ 10,715 |
| Rent and Utilities | $ 1,516 | $ 0 | $ 1,516 |
| Miscellaneous | $ 17,703 | $ 38,981 | $ 56,684 |
| **Total** | **$ 300,000** | **$ 84,220** | **$ 384,220** |

There are always uncertainties when estimating the costs of installing monitoring wells, especially when they are as deep as those planned in the proposal. Drilling targets would need to be prioritized in case costs exceed estimates, allowing the applicant to eliminate wells planned for lower priority targets.

Estimates of drilling costs (the major costs of the project) are realistic and are based on experience in installing similar monitoring wells in the Powder River Basin.

**Environmental Evaluation**

Short-term environmental impacts would result from access to monitoring sites and disturbances when monitoring wells are drilled. These impacts should be mitigated by precautions taken during drilling and by limited surface reclamation.

**Public Benefits Assessment**

Montana citizens would realize direct benefits from this project. Information gained through this project would directly benefit Montana by providing an understanding of the potential impacts of CBM on groundwater and improving decision-making.

Indirect benefits would be realized by decision-making that encourages a balance between development and long-term stability. The long-term regional economy is strongly tied to agriculture, which is dependent on sustained availability of water from coal bed aquifers and the relatively high quality of the water of the Tongue River and its tributaries. Increases in salinity and sodium in the irrigation water can decrease crop yields and induce long-term damage to the soils and crop fertility. Area ranchers also depend on water from coal bed aquifers and coal bed-fed springs for domestic use and cattle watering. Decreases in well or spring productivity or quality would require the installation of deeper wells that are more expensive to operate.

The benefits from this project would be certain and long term. Data collected from the proposed monitoring well network would provide information for calculating discharge rates from CBM wells and would document in advance the quality of discharge water in this area. These data would be used to build a better understanding of the surface water and groundwater geochemistry and interactions. The data would be used as a tool to predict short-term and long-term impacts from CBM operations and water management.

CBM development is at a critical point in Montana. Development is still in its early formative stages, and the potential for water resource damage is unknown. Without the benefits of scientific data, it would be difficult for regulators and land managers to develop effective policies for CBM management. This could lead to long-term damage to the watershed through under-regulation, or it could impede CBM development through over-regulation. The goal of this project is to provide information that would encourage informed decisions about CBM development in eastern Montana.

**Recommendation**

A grant of up to $ 300,000 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

**Project No. 5**

| | | |
|---|---|---|
| **Applicant Name** | Sunburst, Town of | |
| **Project Name** | Sunburst Water Supply Renovation | |
| **Amount Requested** | $ 185,249 | |
| **Other Funding Sources** | $ 9,200 | Applicant |
| | $ 33,509 | Montana Bureau of Mines and Geology |
| **Total Project Cost** | $ 227,958 | |
| **Amount Recommended** | $ 185,249 | |

**Project Abstract** (prepared and submitted by the applicant)

The Town of Sunburst currently has water rights on 12 wells originally drilled to provide water for Texaco's refinery at Sunburst. Mixing water from Well 17, which has hard water, and Well 15, which has soft water, provides water for the community.

In the summer of 2001, bacteria in the water from the soft-water well (Well 15) overwhelmed the town's chlorination system, forcing the town to shut down the well. A sample collected by DEQ was found to contain large amounts of sulfur-reducing bacteria (greater than 100 colony-forming units per milliliter). A preliminary hydrogeologic analysis by the Montana Bureau of Mines and Geology (MBMG) and inspection of the casing using MBMG's downhole camera indicate that a likely source of the sulfur-reducing bacteria is poor quality water from shallow aquifers entering the well through holes caused by corrosion of the steel casing.

The Town of Sunburst, with the assistance of MBMG, proposes to pull the remaining pumps from the unused wells, and clean and sample all the wells for major constituents, metals, sulfur-reducing and iron bacteria, and total petroleum hydrocarbons. Locking caps would be installed, and well bores would be inspected using a downhole camera. Based on a hydrogeologic analysis by MBMG, analytical results, and the condition of all wells, a decision would be made as to which wells would be maintained as a backup source and which wells would be plugged and abandoned.

The above actions at a cost of $227,958 would eliminate unused wells that represent potential sources of contamination and renovate two wells for backup use. Alternatives include (1) taking no action (no cost), and (2) plugging and abandoning all old wells and drilling new wells for the town ($350,000). Uncapped wells represent a liability to the town and other water users in the area because they are potential pathways for contamination from the surface to enter the aquifer.

**Technical Assessment**

The Town of Sunburst currently has water rights on 12 wells originally drilled by Texaco to provide water for its refinery at Sunburst. When the wells, located several miles west of town, were turned over to the town, the pumps had been pulled from some of the wells. Some wells still had turbine pumps in them, but the surface-mounted motors had been removed. The town has used two of the wells for public water supply: Well 17, which has hard water, and Well 15, which has soft water. Water from the two wells was mixed in order to provide potable water suitable for washing and other domestic and public uses. Recently, water quality from the soft-water well (Well 15) became unsuitable for use because bacteria in the water overwhelmed the water treatment chlorination system. A sample of the groundwater collected by DEQ was found to contain sulfur-reducing bacteria at greater than 100 colony-forming units per milliliter.

The water quality problem was originally thought to be related to the drilling of petroleum wells a short distance to the north, but a preliminary hydrogeologic analysis by MBMG and inspection of the casing in Well 15 using MBMG downhole camera appear to rule out contamination from that source. A likely source of the sulfur-reducing bacteria is poor quality water from shallow aquifers entering the well through holes caused by corrosion of the steel casing in Well 15.

Completion of the Sunburst wells consists of 12-inch steel casing set from the surface to the top of the Eagle/Virgelle aquifer and an uncased hole through the water-bearing sands of the aquifer. None of the wells have caps, so they represent potential pathways for contaminants to enter the aquifer from the surface either through the open 12-inch casing or through the pump discharge opening. During a previous MBMG study, oil and grease as well as remains of small animals were found floating on the water in the uncapped wells.

The goal of this project is to provide the Town of Sunburst with a safe and reliable water supply. The objectives of this project are to (1) evaluate all the Sunburst wells for water quality and suitability for use as backup wells (2) plug and abandon wells that will not be needed during their expected lifetime, and (3) rehabilitate two backup wells and the hard-water production well (Well 17).

The following tasks would be completed as part of the project.

1. An inventory of all Sunburst and nearby wells would be completed. Well location, water use, depth, water level, casing diameter, yield, field parameters (pH, Eh, specific conductance, and temperature), and other relevant data would be recorded. These data, along with information from petroleum well logs, water well information from the MBMG Groundwater Information Center (GWIC) database, and geologic maps, would be used to compile a hydrogeologic assessment of the Sunburst area.

2. Unused pumps would be pulled, and the Sunburst wells would be cleaned by surging with air to remove floating oil, grease, and other foreign material. After cleaning, the wells would be sampled for major constituents, metals, sulfur-reducing bacteria, iron bacteria, and total petroleum hydrocarbons. Wells would be inspected with a downhole camera from the surface to the total depth to determine the condition of the surface casing and borehole.

3. One hard-water and one soft-water well would be relined by cementing a plastic liner from below the bottom of the steel casing to the surface. The choices as to plug and abandon or renovate a well would be made based on the hydrogeologic assessment, the condition of the casing, and the water quality. After renovation, relined wells would be purged by pumping and would be resampled. Secure, locking caps would be provided, and power and pipe would be run to the renovated wells to facilitate connection to the system when the need arises. Wells not renovated would be plugged and abandoned by filling them with bentonite chips to within six feet of the surface. The casing would then be cut off at least 3 feet below ground surface, and the site would be regraded to approximately the original contours.

4. The existing pump would be pulled from Well 17, and a plastic liner would be cemented from competent, unfractured rock below the bottom of the steel casing to the surface. The well would be purged by pumping and would be resampled. An appropriately sized submersible pump would be installed and the well would be put back into service.

**Financial Assessment**

The total overall budget for this project consists of the following:

| | RDGP | Matching Funds | Total |
|---|---|---|---|
| Salaries and Wages | $ 30,226 | $ 12,047 | $ 42,273 |
| Employee Benefits | $ 10,998 | $ 4,216 | $ 15,214 |
| Contracted Services | $ 92,493 | $ 0 | $ 92,493 |
| Supplies and Materials | $ 22,360 | $ 0 | $ 22,360 |
| Communications | $ 200 | $ 0 | $ 200 |
| Travel | $ 16,152 | $ 0 | $ 16,152 |
| Rent and Utilities | $ 3,800 | $ 0 | $ 3,800 |
| Miscellaneous | $ 9,020 | $ 26,446 | $ 35,466 |
| **Total** | **$ 185,249** | **$ 42,709** | **$ 227,958** |

Contracted services include laboratory analysis, pump removal and replacement, well rehabilitation, plugging and abandoning of unusable wells, and setting new well liners in wells to be retained. Miscellaneous costs are for the Town of Sunburst's project administration. Supplies and materials, communications, travel, and equipment costs appear to be reasonable for a project of this nature.

The applicant's contribution would be $9,200 for project administration (50% of the administrative cost). An additional contribution would be provided by MBMG ($33,509) in the form of salaries and wages, employee benefits, and indirect costs incurred during the completion of this project.

**Environmental Evaluation**

No long-term adverse environmental impacts should be created due to the abandonment or renovation of the Town of Sunburst's wells. A long-term beneficial impact created by the project would be the protection of the Eagle/Virgelle aquifer water quality. Short-term adverse impacts would be associated with the movement of equipment to and from the site during the abandonment and renovation of the wells. Short-term impacts are anticipated to be minimal.

**Public Benefits Assessment**

Plugging and abandoning or renovating these wells would close pathways for the entry of contaminants from the surface via uncapped casings and from poor quality water from shallow aquifers via corroded casing. Sulfur-reducing bacteria that appeared in Well 15 last year can be difficult to control and impossible to remove from an aquifer such as the Eagle/Virgelle, if not addressed quickly. Protecting the Eagle/Virgelle aquifer would protect the health, safety, and welfare of the residents of Glacier and Toole Counties who rely on water from that source, as well as residents of the town. Direct benefits to the town would include reduced water treatment cost, a reliable community water supply suitable for household and other public use, and provision for a readily available backup system. Cleaning and plugging or renovating the Sunburst wells would help ensure long-term integrity of the groundwater resource.

**Recommendation**

A grant of up to $185,249 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

**Project No. 6**

| | | |
|---|---|---|
| **Applicant Name** | Montana Board of Oil and Gas Conservation | |
| **Project Name** | Fate and Transport of Impounded Coal Bed Methane Water | |
| **Amount Requested** | $ 200,000 | |
| **Other Funding Sources** | $ 220,000 | Applicant |
| | $ 780,000 | U.S. Department of Energy (DOE) |
| **Total Project Cost** | $ 1,200,000 | |
| **Amount Recommended** | $ 200,000 | |

**Project Abstract** (prepared and submitted by applicant)

Coal bed methane (CBM) is a naturally occurring, clean burning fuel, the production of which constitutes a potentially significant new industry for Montana. Current estimates indicate that there are 39 trillion cubic feet (TCF) of CBM beneath the Powder River Basin (PRB), and a recent reasonable foreseeable development scenario prepared for Montana predicted as many as 22,400 new productive wells. Each of these wells also will co-produce large volumes of water that must be managed. Managing these volumes of produced water is a significant cost, a significant regulatory burden, and a significant public relations problem.

Produced water quality varies across PRB, where it is often low in total dissolved solids (TDS) but high in sodium content. Sodium content can restrict beneficial use options and increase management costs for operators. One important management option will be impoundments that allow percolation of the produced water into the subsoil and bedrock while also allowing ranchers to run cattle on pastures without natural surface water. Impoundments have the potential to be widely used across PRB.

The objectives of the proposed research are to measure any actual threats, document water-handling capacities, and establish siting, construction, and operational guidelines.

The Montana Board of Oil and Gas Conservation (BOGC), in cooperation with ALL Consulting of Tulsa, Oklahoma, has obtained funding from DOE for support of this project. DOE will provide $780,000 as part of the National Energy Technology Laboratory's grant program called *Focused Research in Air Quality and Produced Water Management in Oil and Gas E&P*.

The research will focus on PRB with data gathered from the entire region and field studies conducted at new and existing impoundments throughout the basin. Modeling will be performed to provide data for siting, construction options, geochemical changes, and the fate and transport of produced water. The results of these various project initiatives will be summarized in a guidebook. It is anticipated that the project will last approximately 24 months.

**Technical Assessment**

BOGC and its cooperators propose to study the fate and transport of impounded CBM water in order to develop risk-based regulatory limits for siting and construction of impoundments. The fate and transport of water discharged to impoundments potentially could be the most significant and least understood aspects of managing water produced during coal bed methane production. In addition to the poor understanding of the potential problem, the regulatory framework for addressing impounded coal bed methane water may not be adequate. Consequently, understanding the fate and transport of impounded coal bed methane water and developing regulations that protect downstream surface water users should be high priorities for state and federal agencies.

BOGC proposes to use a combination of site-specific and regional-scale characterization, monitoring, and modeling to investigate the fate and transport of CBM water in the Powder River geologic basin. The proposed work holds promise; however, there has been insufficient coordination with other state or federal agencies in developing the research objectives and work tasks. A committee of scientists from the Montana Department of Environmental Quality (DEQ) Water Protection Bureau or Standards Section, the DNRC Water Resources Division, U.S. Bureau of Land Management (BLM), and BOGC should be selected to advise researchers throughout the project to ensure that representative and useful data are obtained. In addition to siting and construction requirements, a focus of the proposed research should be to develop requirements for characterization and monitoring to be conducted by CBM operators at all CBM impoundments. Further, siting and construction requirements developed through the proposed research need to mitigate disruptions to natural surface water flows caused by impoundments.

The combination of an improved understanding of the fate and transport of CBM-produced water attained through the proposed study, site-specific data on soil and rock properties collected by CBM operators, and a requirement for water level and quality monitoring by CBM operators should provide a sound basis for permitting CBM impoundments and verifying that impacts are mitigated. The proposed research can provide a strong basis for this approach.

The fate and transport of CBM water from impoundments are poorly understood and are significant issues related to CBM development. The proposed project is promising, but needs to be revised with input from other state and federal agencies involved in CBM. Specifically, the technical approach should be modified to focus on characterization and monitoring of site conditions instead of fate and transport modeling. Detailed information on the mineralogy of clay minerals in soils and rock and the chemistry of pore waters beneath impoundments used for research are needed to evaluate the geochemical evolution of CBM water in groundwater. In addition, shallow aquifers need to be delineated, and hydraulic and dispersion properties of aquifers need to be estimated in order to evaluate transport of solutes beneath impoundments used for research. The results of characterization and

monitoring work should be used to develop characterization and monitoring requirements for permitting CBM impoundments, in addition to developing siting and construction requirements.

BOGC highlights the crucial need to "define the required safeguards necessary for protecting surface [water] and shallow aquifers from infiltration influences." According to the 2002 Draft Statewide Oil and Gas Environmental Impact Statement (EIS), 2.9 billion gallons of water will be produced annually as a byproduct of producing methane from coal seams in the Montana portion of the Powder River Basin. Some of this water will be consumed by stock, industrial, or domestic uses, but the majority of water will be discharged to impoundments where it will either evaporate or infiltrate groundwater. Significant impacts may occur to crops if this high sodium water reaches surface waters that are used for irrigation.

**Financial Assessment**

The total overall budget for this project consists of the following:

| | RDGP | Matching Funds | Total |
|---|---|---|---|
| Salaries and Benefits | $ 0 | $ 14,613 | $ 14,613 |
| Employee Benefits | $ 0 | $ 3,027 | $ 3,027 |
| Contracted Services | $ 200,000 | $ 980,000 | $ 1,180,000 |
| Communications | $ 0 | $ 470 | $ 470 |
| Travel | $ 0 | $ 450 | $ 450 |
| Miscellaneous | $ 0 | $ 1,440 | $ 1,440 |
| **Total** | **$ 200,000** | **$1,000,000** | **$ 1,200,000** |

The applicant, in cooperation with ALL Consulting, prepared and submitted an application on May 1, 2002, for a DOE cost-shared research project grant. The selection decision for funding was on August 30, 2002 and awards are anticipated within 120 days following selection. BOGC plans, if selected, to fulfill the DOE's 20% matching requirement with the requested $200,000 grant and will provide approximately $20,000 of in-kind contribution to the project for coordination and senior oversight and review. Additionally, BOGC will submit a "new proposal" in its 2003-04 budget request for an additional $200,000 from the legislature to support this project. Consultant costs will generally raise the cost of this project. If this project is funded with RDGP funds, considerably less effort and expense should be devoted to fate and transport modeling and more emphasis placed on monitoring and site-specific characterization at locations in Montana.

The project will not require any additional funding beyond the period for which these funds are requested.

**Environmental Evaluation**

The research proposed here would have little or no direct impact on the environment. Field sampling activities and well installations would involve ongoing disruption of soils and vegetation, but the impacts are easily and properly mitigated by minimal use of vehicles in sensitive or fragile areas. Well completion must adhere to applicable state/federal requirements.

**Public Benefits Assessment**

Indirect benefits to Montanans include the preservation of the produced water resource to promote beneficial reuse, e.g. stock and wildlife watering. Study results would also provide useful information regarding the protection of surface and shallow aquifers, possible reintroduction of CBM-produced water into the hydrologic system, and CBM economics. This project will also generate a GIS database that will identify natural characteristics of the basin by spatial relationship, which will be a useful benefit to many state agencies including DNRC, DEQ, BOGC and the Montana Department of Fish, Wildlife and Parks (DFWP), to name a few.

Other benefits may include the increased state and local tax revenues from CBM development, increased employment opportunities, and the increased level of environmental protection. These indirect benefits will be

available due to the added knowledge of the region and increased development allowed through identifying the relationships between the infiltrate and the geochemical processes affecting the water as it percolates.

**Recommendations**

A grant of up to $200,000 is recommended for this project contingent upon DNRC approval of the project scope of work and budget. A committee of scientists representing DNRC, BOGC, BLM, and DEQ should be selected to advise researchers regarding the design and implementation of the project in Montana.

**Project No. 7**

| | | |
|---|---|---|
| **Applicant Name** | Montana Department of Environmental Quality | |
| **Project Name** | Drumlummon Tailings and Goldsil/Argo Millsite and Mine Waste Reclamation – Phase I | |
| **Amount Requested** | $ 300,000 | |
| **Other Funding Sources** | $1,500,000 | Applicant |
| **Total Project Cost** | $1,800,000 | |
| **Amount Recommended** | $ 300,000 | |

**Project Abstract** (prepared and submitted by the applicant)

The Drumlummon Tailings and Goldsil/Argo Millsite and associated mine wastes sites are both listed on DEQ's priorities list of abandoned/inactive projects (47th and 5th, respectively). These mine sites are situated in the upper portion of the Silver Creek watershed near the town of Marysville, Lewis and Clark County, Montana. More specifically, the sites are situated within Section 36, Township 12 North, Range 6 West; Section 1, Township 11 North, Range 6 West; Sections 33 and 34, Township 12 North, Range 5 West; and Section 31, Township 11 North, Range 5 West.

The mine wastes are actively eroding sediments and metals into Silver Creek. The most notable contaminant of concern is mercury. Previous mining practices lead to substantial releases of mercury into Silver Creek and the surrounding area. Preliminary waste volume estimates for these sites include 700,000 cubic yards of tailings at the Goldsil mill area, and 178,630 cubic yards of tailings and 9,020 cubic yards of waste rock associated with the Drumlummon tailings and mill area, respectively.

DEQ has been working with the Lewis and Clark County Weed Board, landowners, and the Montana Department of Transportation to address associated problems within the Silver Creek watershed. Reclamation of the sites would be conducted by DEQ's Mine Waste Cleanup Bureau and would most likely consist of mine waste consolidation into a single mine waste repository with an impermeable cap to be placed over the repository area, thereby eliminating receptor contact with the contaminated mine wastes. Upon completion of reclamation activities, the site would be revegetated with native plant species. Project construction is estimated to take 90 days.

This reclamation project is the first of a phased approach to reclaiming the effects of mining wastes on the upper portion of the Silver Creek drainage basin.

**Technical Assessment**

The DEQ Mine Waste Cleanup Bureau uses the Abandoned Inactive Mine Cleanup Procedure to conduct removal actions on all hard rock mines. The procedure would be used to clean up the Drumlummon tailings and Goldsil/Argo millsite. The first step in the procedure is to conduct a Preliminary Assessment, which entails mapping, sampling, scoring and ranking of the site, which has been completed at the Drumlummon tailings and Goldsil/Argo millsite. A Current and Past Owner/Operator Report and a Community Relation Plan are being

developed. In addition, the Reclamation Work Plan, Site Survey, Laboratory Analytical Plan, Field Sampling Plan, Quality Assurance Plan, and Health and Safety Plan are being prepared. The Site Characterization for the Silver Creek drainage, conducted during the summer and fall of 2002, includes a detailed physical and chemical characterization of the drainage, the tailings, and the millsite. Upon completion of the above tasks, an EEE/CA for the site, which completely analyzes the alternatives for the reclamation of the site and identifies all applicable and relevant and appropriate requirements (ARARS), will be prepared. Some of the ARARS that typically apply come from the National Historic Preservation Act, the Clean Water Act, and the Endangered Species Act. The EEE/CA will be completed early 2003.

The Silver Creek Drainage Reclamation Project EEE/CA will describe all feasible reclamation alternatives, the cost of each alternative, and the pros and cons of each alternative. The selected alternative will meet the overall goal of the project, which is to minimize and reduce the risk to human health and the environment resulting from the contaminants on the sites. The cost of this first phase of the Silver Creek Drainage Reclamation Project is approximately $1,800,000. The final project cost for this phase may be higher or lower, depending on the specific alternative that is selected.

In general, the selected alternative for the majority of the mines reclaimed by the Mine Waste Cleanup Bureau over the past seven years has involved placement of the mine waste into a repository. These engineered repositories isolate the mine waste from the natural elements and reduce human exposure to the contaminants. The repository design is typically similar to a landfill, which is capped and lined with an impervious cap and soil. The disturbance is then revegetated for long-term success and site stability.

The information furnished by DEQ supports the ranking and priority of these three sites. High levels of heavy metals (copper, lead, zinc), plus arsenic, present significant threats to human health and the environment. For RDGP review and evaluation purposes, the application presents sufficient documentation to justify funding in the $300,000 amount requested.

**Financial Assessment**

The estimated project cost of $1,800,000 is based on site complexity, mine waste volume, necessary environmental and engineering investigations, construction material quantities, and construction difficulties. An administrative grant issued to DEQ's Mine Waste Cleanup Bureau by the U.S. Office of Surface Mining will provide for all costs of in-house personnel including salary, employee benefits, supplies, materials, communication, travel, rent, utilities, miscellaneous expenses, and indirect costs. A second grant will be provided for contracted environmental and engineering services and construction costs specific to the Drumlummon Tailings and Goldsil/Argo Millsite Reclamation Project. The RDGP grant would be used to supplement the contracted construction costs specific to this reclamation project.

The total overall budget for this project consists of the following:

| | RDGP | Matching Funds | Total |
|---|---|---|---|
| Contracted Services | $300,000 | $1,500,000 | $1,800,000 |
| **Total** | **$300,000** | **$1,500,000** | **$1,800,000** |

**Environmental Evaluation**

The project would reduce contaminant mobility at the site by removing the highest risk solid media contaminant sources and disposing of these wastes in an engineered repository. This action should result in a long-term beneficial impact to Silver Creek and the surrounding area. The construction is likely to be of short duration (90 days) and will be completed in a single field season. Short-term impacts such as fugitive dust and increased vehicle traffic are expected. A 310 permit and 3A authorization would likely be required. Mitigation of adverse impacts would be addressed in the site environmental assessment to be prepared by DEQ.

**Public Benefits Assessment**

The health benefits are hard to quantify; however, one of the direct benefits to be derived from the reduction of contaminants would likely be a decreased health risk to those who may visit the site. Other benefits would be improved water quality, improved air quality, and improved wildlife habitat. Some indirect benefits would likely be reduced costs of health care and improved recreational opportunities. Currently, DFWP has Silver Creek posted as catch-and-release fishing only, due to mercury contamination. Reclamation of the primary sources of mining-related waste contamination should result in drastic improvement of the creek's water quality.

Reclamation of the Drumlummon tailings and Goldsil/Argo millsite would significantly reduce or eliminate contaminant migration off-site; eliminate the possibility of human contact with contaminated soil, waste rock, and tailings; and stabilize steep slopes. Direct benefits would accrue to the environment, recreationists, and contractors and consultants hired to perform the reclamation. Surrounding public and private lands would also be enhanced, as would the water quality of Silver Creek.

**Recommendation**

A grant of up to $300,000 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

**Project No. 8**

| | |
|---|---|
| **Applicant Name** | Toole County |
| **Project Name** | 2003 Plugging and Abandonment Aid to Small, Independent Oil Operators |
| **Amount Requested** | $ 300,000 |
| **Other Funding Sources** | $ 4,016 Applicant |
| **Total Project Cost** | $ 304,016 |
| **Amount Recommended** | $ 240,000 |

**Project Abstract** (prepared and submitted by applicant)

The Kevin-Sunburst Field and a large portion of Toole County exhibit the problems associated with oil fields produced between 1910 and 1940. Past drilling practices created an unusually large number of what are now stripper and/or uneconomic wells. The establishment of the Montana Board of Oil and Gas Conservation (BOGC) led to regulations regarding well and field spacing for more efficient extraction, established reservoir economics, and bonding requirements for reclamation.

The world economy dictates prices paid to producers in Toole County. The price in the first quarter of 2002 was $10.00 per barrel. Constantly fluctuating prices, when applied to wells in many cases producing as little as one-quarter to one-half barrel per day, severely impact the ability of operators to make a living.

Consequently, operators are unable to meet board requirements or the need to plug wells that produce marginally or have downhole mechanical problems. Allowed to go unchecked, the number of uneconomic, problem wells presents a growing liability to the State as operators forfeit bonds and cease doing business.

Timely application of these RDGP funds to eliminate or reduce the growing numbers of uneconomic wells could be best accomplished by operator involvement, because the costs would be reduced by using operator knowledge and equipment. This reduction of problem wells would reduce emissions of hazardous gas (hydrogen sulfide, carbon dioxide, and hydrocarbons) venting to the atmosphere and return the land to productive agricultural use.

This project is a continuation of a 1999-funded project. The small operators of Toole County have gotten together and independently hired Health and Environmental Management Services to write and manage the application, which Toole County has agreed to sponsor. The application requests the standard 24-month contract. This second request for funding barely begins to address the problems that exist in Toole County.

**Technical Assessment**

The proposal is identical to Toole County's Aid to Independent Small Oil Operators grant application submitted to RDGP in 1998. That project was funded by the 1999 Legislature for $300,000. A total of $240,425 of the 1999 grant was used to plug and abandon 209 wells (at an average cost of $1,150 per well). The remaining $59,575 was unspent.

Glacier County is just beginning the same type of project using $150,000 in RDGP funds approved by the 2001 Legislature. Both of these plugging efforts are in response to BOGC requirements that state that any wells not capable of production or determined unfeasible for future recovery operation or disposal activities shall within one year be plugged and abandoned, unless otherwise authorized by BOGC.

Strict enforcement of the rule would likely force many small operators out of business. Abandoned operations would ultimately be the responsibility of the State and BOGC. It therefore seems prudent to plug these wells now, at much less cost because of using operator equipment and manpower, than for the state to conduct plugging at a much higher cost later.

The relevant question needing to be addressed on the current request seems to be how many of the operators (and thus wells) that are eligible for this program will make the financial commitment to participate. The application included letters of support from the county commissioners, BOGC, area legislators, and seven oil and gas small operators. The grant is recommended for that level of funding commensurate with the likely number of operators participating and the number of wells.

The applicant has furnished DNRC with documentation indicating that local small operators have made firm commitments to plug 190 wells. The average cost of plugging an individual well in the 2001 project was $1,150. Thus, plugging 190 wells would cost about $218,500, not including costs of a consultant to administer the project. A total of $ 240,000 is recommended for funding. According to BOGC, there are 900 shut-in wells eligible for RDGP monies.

**Financial Assessment**

The total overall budget for this project consists of the following:

| | RDGP | Matching Funds | Total |
|---|---|---|---|
| Contracted Services | $300,000 | $4,016 | $304,016 |
| **Total** | **$300,000** | **$4,016** | **$304,016** |

The services of a consulting firm would be enlisted to administer this project, and overtime pay is included in the proposed budget for BOGC field inspections. The cost of inspecting the plugging operations ($6,000) is legitimate if BOGC would have to hire outside help to oversee the abandonment operations. However, overtime pay to BOGC employees would seem to be part of the BOGC Oil and Gas Conservation Division budget and not compensable from RDGP.

**Environmental Evaluation**

No long-term environmental impacts should be created in the plugging and abandonment of the proposed wells, provided reclamation activities are conducted properly. Short-term adverse impacts associated with the movement of equipment to the sites would be expected. Compacted soil and destroyed vegetation on access routes would be reclaimed upon project completion, and any debris would be hauled off-site and disposed of in a

licensed landfill. Short-term air pollution (e.g., dust and emissions from combustion engines) would be minimal, if equipment and traffic routes are watered as necessary and mechanized equipment is in proper working condition.

**Public Benefits Assessment**

Improvement and protection of water, vegetation, mineral, and soil resources would be the primary benefits of this project. If this project results in decreased numbers of problem wells being turned over to the State of Montana by small operators, then public dollars would be saved. These savings would benefit all Montanans.

**Recommendation**

A grant of up to $ 240,000 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

**Project No. 9**

| | | |
|---|---|---|
| **Applicant Name** | Montana Department of Environmental Quality | |
| **Project Name** | Bluebird Mine Reclamation | |
| **Amount Requested** | $ 300,000 | |
| **Other Funding Sources** | $ 680,000 | Applicant |
| **Total Project Cost** | $ 980,000 | |
| **Amount Recommended** | $ 200,000 | |

**Project Abstract** (prepared and submitted by applicant)

The purpose of this project is to address human health and safety hazards associated with exposed and accessible heavy metals and acid mine drainage originating from the Bluebird Mine. The Bluebird Mine site contains 71,000 cubic yards of waste rock that is currently deposited in the Curtain Creek drainage and eroding into Spring Creek and, ultimately, Prickly Pear Creek. Eroded waste rock is visible along the Curtain Creek stream bank for a distance of 2,500 feet below the mine site, and dissolved metals and acid water can be detected several miles downstream from the mine. The site wastes contain significantly elevated levels of arsenic, lead, mercury, zinc, copper, and manganese. Site surface water and groundwater degradation have been documented. Site water sampling clearly indicates contaminant migration off-site. Contaminated soil and waste have affected trees, grasses, and shrubs; much of this vegetation has succumbed to heavy metal poisoning and acidity. The Bluebird Mine ranks at 23 of 270 sites in DEQ's *Abandoned Hardrock Mine Priority Sites 1995 Summary Report.*

The primary objectives of this project are to (1) remove solid media contaminant sources located at the Bluebird Mine site and those materials that have eroded into Curtain Creek, and (2) dispose of these wastes in a constructed repository. Site surface water would be isolated from contact with contaminated mine wastes, and all disturbed areas would be regraded, topsoiled, and revegetated. When the above tasks are completed, heavy metals exposure and migration would be significantly reduced or eliminated. Water quality would be improved, and the site and lower stream areas would again be able to support a native stand of vegetation species.

The DEQ Mine Waste Cleanup Bureau (MWCB) would be the organization responsible for conducting this reclamation project.

The Bluebird Mine is located approximately 3.5 miles west of the townsite of Wickes, Montana, in the Colorado Mining District, Jefferson County. Specifically, the Bluebird Mine occupies approximately 5 acres in the headwaters of Curtain Creek in Section 13, Township 7 North, Range 5 West.

All environmental and investigation tasks for this project are currently in progress. The Expanded Engineering Evaluation and Cost Analysis (EEE/CA), engineering design, bid package, and bidding process need to be completed, which would require 16 to 20 months. Once construction is implemented, the project should be completed in 120 consecutive calendar days. Following construction, a final report would be completed in two months.

**Technical Assessment**

Currently, approximately 71,000 cubic yards of waste rock are associated with this abandoned mine. Testing revealed that the following elements were present and elevated at least three times their background levels: arsenic - 587 mg/kg; zinc – 1,919 mg/kg; copper - 441 mg/kg; and lead - 4,990 mg/ kg. Three discharging adits are presently contributing acid mine drainage that exceeds acute and chronic aquatic life criteria for cadmium, copper, zinc, iron, and lead. Detailed information on all aspects of the site is available in the Hazardous Materials Inventory Site Summary, which is appended to the grant application.

The reclamation process used by DEQ's MWCB is designed to comply with the requirements of the NCP, the CERCLA, and the Montana CECRA. Certain aspects of the process have been streamlined to meet the regulatory and functional needs of cleaning up relatively small abandoned mine sites that are generally situated in remote locations. DEQ's MWCB conducted initial investigations at the Bluebird Mine in 1992.

The EEECA for the Bluebird Mine is currently being developed by a private consultant. It will address reclamation alternatives at the site that will include:

- No action
- Institutional controls
- Surface controls
- Containment
- Excavation and off-site disposal

Selection of a preferred option for cleanup will be based on the following NCP criteria:

- Overall protection of human health and the environment
- Compliance with state, federal, and local rules and regulations
- Long-term effectiveness and permanence
- Reduction of toxicity, mobility, and volume through treatment
- Short-term effectiveness
- Implementability
- Cost
- Community acceptance

The information furnished by DEQ supports the ranking and priority of this site. High levels of heavy metals (cadmium, mercury, iron, copper, lead, zinc), plus arsenic, present significant threats to human health and the environment. For RDGP review and evaluation purposes, the application presents sufficient documentation to justify funding in the $300,000 amount requested.

**Financial Assessment**

The estimated project costs of $980,000 are based on anticipated site complexity, necessary engineering investigations and design, construction effort, material quantities, and expected construction difficulties. An administrative grant issued to DEQ by the federal Office of Surface Mining will provide for all costs of in-house personnel including salary, employee benefits, supplies, materials, communication, travel, rent, utilities, miscellaneous expenses, and indirect costs. A second project grant issued to DEQ-MWCB will provide for costs associated with engineering design and construction specific to the Bluebird Mine Reclamation Project. RDGP funding would be used to supplement the contracted construction costs.

The total overall budget for this project consists of the following:

| | RDGP | Matching Funds | Total |
|---|---|---|---|
| Contracted Services | $300,000 | $680,000 | $980,000 |
| **Total** | **$300,000** | **$680,000** | **$980,000** |

**Environmental Evaluation**

The project would reduce contaminant mobility at the site by removing the highest risk solid media contaminant sources and disposing of these wastes in an engineered repository. This action should result in long-term beneficial impact to Curtain Creek, Spring Creek, and the surrounding area. The construction would likely be of short duration (120 days) and would be completed in a single field season. Short-term impacts, such as fugitive dust and increased vehicle traffic, are expected. A 310 permit and 3A authorization would likely be required. Mitigation of adverse impacts will be addressed in the site environmental assessment to be prepared by DEQ.

**Public Benefits Assessment**

This project would address human health and safety risks associated with heavy metals contamination at the site. The project would eliminate the possibility of human contact with contaminated soils, waste rock, and tailings. The project would also reduce or eliminate the possibility of human contact with waterborne heavy metal contamination.

Sites hazards and contamination, both on- and off-site, would be reduced or eliminated. Public lands and waters would be enhanced. Aesthetic beauty would be restored to the landscape, and a short-term economic benefit would be realized.

Indirect benefits of the site reclamation would include secondary economic benefits resulting from project construction, water quality enhancement of the receiving streams, and economic benefits from increased use of the general area.

**Recommendation**

A grant of up to $200,000 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

**Project No. 10**

| | | |
|---|---|---|
| **Applicant Name** | Sheridan County Conservation District | |
| **Project Name** | Protecting Natural Resources by Reclaiming Oil-Field Brine-Contaminated Soils | |
| **Amount Requested** | $ 299,950 | |
| **Other Funding Sources** | $ 6,300 | Applicant |
| | $ 34,765 | Landowners |
| | $ 18,225 | Montana Bureau of Mines and Geology |
| | $ 40,000 | U.S. Forest Service |
| **Total Project Cost** | $ 399,240 | |
| **Amount Recommended** | $ 150,000 | |

**Project Abstract** (prepared and submitted by applicant)

Oil-field brines migrating from reserve pits and other oil-field sites have contaminated soil and groundwater at many locations in Sheridan County. Landowners have reported increasing problems with contaminated soils and water resources overlying and adjacent to oil-field sites in Sheridan County. These problems include sterile soils, contaminated wells, sinkhole development, and accelerated erosion. Wetlands and wildlife habitat have also been degraded.

Sheridan County Conservation District has been compiling locations of many of these problems over the past several years. Most of the problems were not as apparent during the dry climatic conditions of the 1980s, but the effects of the contamination became obvious during the more normal climatic conditions of the 1990s. A more moist climatic cycle will likely cause greater problems than are currently observed.

Wastes associated with hydrocarbon production have typically been disposed on or near each drilling site in northeastern Montana. These wastes are generally buried in lined reserve pits, but commonly the liners are breached, allowing the salt-saturated mud to move into unlined trenches. Based on conservative estimates of pit volume and brine concentrations, each pit contains as much sodium chloride salt as a 260-ton salt block. Brines are extremely mobile, and only infiltrating snowmelt or rainfall dilutes the salt load. The rate of dilution is very slow, and high concentrations of salt can be found in both the soil and the groundwater below a site for decades. Migration of brine results in salt-contaminated soil and groundwater off-site. Upward migration of salt is common in areas with high water tables, resulting in the movement of salt into the soil and the effective sterilization of the soil so that it cannot support vegetation.

This project is proposed to mitigate salt contamination by removing the source, isolating the contamination, or by other means restoring soil productivity and maintaining groundwater quality.

**Technical Assessment**

The purpose of this project is conservation of soil and water resources associated with brine contamination at oil-field reserve pits. Approximately 900 exploration wells have been drilled in Sheridan County. At each well, a reserve pit was constructed for separation and storage of drill cuttings, drilling mud, and produced water. Oil-field brines from reserve pits and other oil-field sites have contaminated soil and groundwater at many locations in Sheridan County and other sites in central and eastern Montana. Landowners have reported increasing problems with contaminated soil and groundwater overlying and adjacent to oil-field sites in Sheridan County. Typical problems include sterile soils, stunted vegetation, contaminated wells and surface water, sinkhole development, and accelerated erosion. Impacts to agriculture, water quality, wildlife, and aquatic resources are common at highly impacted sites.

Sheridan County Conservation District (CD) and the Montana Bureau of Mines and Geology (MBMG) have compiled locations of many of the problem oil-field sites over the past several years.

The goal of the project is to reclaim 15 to 30 oil-field brine-contaminated reserve pits in Sheridan County. The general approach appears to be sound and technically feasible. Brine contamination problems have existed since the 1950s and 1960s. In outwash aquifers, brine contamination has been detected more than half a mile downgradient of abandoned oil well sites. Many of the sites that appear to be adequately reclaimed and stable for more than a decade have subsided. Currently, 24 landowners have expressed interest in cleaning up reserve pits on their property. More candidate cleanup projects are anticipated once the project gets started.

Sodium chloride is not considered a hazardous waste, and the reserve pit material could most likely be placed in local landfills upon the county's approval of a permit. Testing of the material might be required if additives other than salt, such a diesel or other products used to adjust drilling fluid density, are in the contaminated material. Alternatively, on-site disposal might be an option if nearby areas are clayey and elevated relatively far above the water table. Local conditions and trucking costs would have to be evaluated in order to propose the most feasible and economical solution, if contaminated materials need to be removed.

At this time, the Montana Department of Environmental Quality (DEQ) has not been involved with cleaning up former oil well reserve pits. Since some sites are likely a potential threat to surface water quality, aquatic resources and even human health, DEQ involvement might be necessary at the most contaminated sites in terms of selecting alternatives and ensuring that regulatory compliance standards or narrative beneficial use criteria under the Clean Water Act are met.

Of particular concern are that (1) the number of sites that would potentially be cleaned up is relatively small, compared to the number of reserve pits, and (2) the proposed cleanup sites might not follow a countywide prioritization plan. To this end, project funding should be directed to locations that have some of the worst contamination problems and where multiple media (e.g., soil, groundwater, and surface water) are impacted. To help determine some of the most contaminated sites, information from the pending U.S. Fish and Wildlife Service (USFWS) Medicine Lake Wildlife Refuge study might be valuable. Also, sites where groundwater contamination might affect drinking water, should be considered as key areas to invest RDGP funding. A technical advisory committee is proposed to review the MBMG assessment report. The committee should also review the pending USFWS findings to develop a ranking of all the potential sites. A major consideration for the advisory committee should be to compare the environmental benefits of cleaning up an individual site with the estimated cost. Reclamation costs would be estimated based on the most economic and feasible cleanup plan.

For sites being considered for cleanup and reclamation using RDGP funds, the conservation district and MBMG would have to first work with the Montana Board of Oil and Gas Conservation (BOGC) to determine that there is no identifiable party responsible for cleaning up the contamination. A MBMG hydrogeologist would carry out the proposed assessment, monitoring, and site inspection work. Contractors would be hired directly by the landowners to conduct the reclamation and cleanup work. If possible, projects should be coordinated to minimize costs.

The project is anticipated to take about 2 years to complete. The site assessment portion is expected to take about 6 months. Reclamation and monitoring efforts would take up to 18 months.

In order to attain the project goal stated above, four principal objectives for the project were identified:

1. Assessment and outreach with landowners
2. Project ranking
3. Reclamation work
4. Monitoring

Two alternatives were considered: taking no action, and implementing the proposed project. In general, these are the two project alternatives available, short of a regulatory agency (e.g., DEQ) taking the lead in addressing the contaminated sites. DEQ's caseload is currently large and probably prohibits DEQ from taking the lead in cleanup efforts on these sites. Therefore, the proposed project strategy is justified, and the conservation district should be encouraged to address these sites.

**Financial Assessment**

The total overall budget for this project consists of the following:

| | RDGP | Matching Funds | Total |
|---|---|---|---|
| Salaries and Wages | $ 4,500 | $ 4,500 | $ 9,000 |
| Employee Benefits | $ 1,800 | $ 1,800 | $ 3,600 |
| Contracted Services | $ 289,950 | $ 92,990 | $ 382,940 |
| Supplies and Materials | $ 2,000 | $ 0 | $ 2,000 |
| Communications | $ 200 | $ 0 | $ 200 |
| Travel | $ 1,500 | $ 0 | $ 1,500 |
| **Total** | **$ 299,950** | **$ 99,290** | **$ 399,240** |

Total RDGP funding that is being requested is $299,950 with most of the funding ($197,000) being requested for construction activities. Other RDGP funds would pay salaries, wages, and benefits for the project administrator; travel; communications; and supplies and materials, which total $10,000. Contracted services include MBMG professional staff and remediation services hired by the landowners. The cost for assessment, prioritization, and monitoring is estimated at $92,500.

Landowners would be responsible for providing matching funds based on the actual reclamation costs. The total landowner match is estimated at approximately $34,765, based on the current budget. MBMG would contribute $18,225 and USFWS would provide $40,000 in matching funds for an assessment of the Medicine Lake area.

According to MBMG, estimated reclamation costs may range from $2,000 for cleaning up and capping a pit to more than $20,000 for hauling and disposing of brine-saturated waste in a landfill. It is estimated that costs will vary widely between the different types of reclamation projects. Surface damage ranges in area from 0.5 acre to more than 5 acres at each site. The proposed budget is anticipated to reclaim 15 to 30 sites.

The project costs provided seem to be accurate, and it appears that sufficient funds are requested to initiate a good pilot project. Comparisons of the costs of the various phases of reclaiming a contaminated site (e.g., transporting the soil, revegetating) were not provided in the application. This project should be used to begin to outline the costs and feasibility of conducting a broader reclamation effort for highly contaminated oil-field reserve pits in central and eastern Montana.

**Environmental Evaluation**

The project would be designed to mitigate damage to soil and aquifers. No long-term adverse environmental impacts are anticipated in conjunction with the proposed reclamation with either on-site or landfill disposal options. Short-term impacts might include soil and vegetation disturbance at the sites, but those impacts are anticipated to be temporary and could be easily mitigated. Emissions would be generated from combustion engines and vehicular traffic, and the potential for leaking oil and other fluids on the ground surface would increase. These impacts would be relatively minor and could be easily mitigated or avoided by using well-maintained equipment, dust suppression, and site grading and restoration after the project is complete.

**Public Benefits Assessment**

Benefits could be substantial to individual landowners participating in the project if large impacted areas are brought back into agricultural production by eliminating soil contamination. Additional public benefits could accrue to affected landowners and others in terms of improved groundwater and surface water quality, aquatic resources, and wildlife habitat. Other public benefits would be possible from eliminating safety issues associated with subsidence at reserve pits and potential human health effects from consuming contaminated groundwater at the most contaminated sites.

**Recommendation**

DNRC recommends funding a grant up to $ 150,000 contingent upon DNRC approval of the project scope of work and budget. The scope of work should be adjusted to state that the project would attempt to address the most contaminated sites with this funding, based on doing a cursory evaluation of many reserve pit sites, findings from the MBMG assessment work, input from USFWS and its pending assessment, and input from BOGC. Areas should be targeted that have shallow groundwater and groundwater/surface water connections where former reserve pits may be leaching brine contamination. Focusing the RDGP funds in these areas would offer the most public benefit in terms of improving resources, and addressing health and safety concerns. Also, recommendations on how to improve oil-field reserve pit closure should be prepared for the benefit of BOGC benefit. Lastly, a matrix of cost comparisons should be developed to outline a more detailed range of costs and alternatives for reclamation activities.

**Project No. 11**

| | | |
|---|---|---|
| **Applicant Name** | Governor's Office of Economic Opportunity | |
| **Project Name** | Growing Carbon: "Applying Market-Based Conservation through Carbon Sequestration" | |
| **Amount Requested** | $ 300,000 | |
| **Other Funding Sources** | $ 191,000 | National Carbon Offset Coalition |
| **Total Project Cost** | $ 491,000 | |
| **Amount Recommended** | $ 150,000 | |

**Project Abstract** (prepared and submitted by the applicant)

The Growing Carbon proposal submitted by the Governor's Office of Economic Opportunity is designed to establish a market-based conservation program to aggregate and trade carbon credits nationally.

The proposal would be implemented in cooperation with the National Carbon Offset Coalition (NCOC), a Montana- based nonprofit developed through the collective efforts of Montana's Resource Conservation and Development Areas (RC&Ds) and Montana Watershed, Inc., a conservation-district-based organization. NCOC is organized to engage in the emerging carbon credit market. The project builds on past State of Montana grants and other funding sources utilized by NCOC to establish the organization's operational capacity. The NCOC program would provide Montana with the opportunity to develop intelligent ways to use the emerging market-based tools for implementing voluntary greenhouse gas emission reductions.

The program would provide landowners, corporations, and tribal and local governments an opportunity to participate in a market-based conservation program that could help offset the environmental impact of carbon dioxide (CO2) emissions while providing Montana landowners a new, marketable commodity. A successful program would provide a new source of revenue to support soil and water conservation and improved grazing and sustainable forest programs.

Montana's electric power industry would be better positioned to grow, while managing future greenhouse gas obligations, if it begins now to help create Montana's capacity to administer low-cost emission mitigation systems. The program would provide Montana's electric companies and other carbon emitters access to low-cost carbon emission reduction credits through a voluntary, market-based approach being advocated by President Bush's recently announced Climate Change Initiative. In addition, the program is designed to return 8% of every trade, including those done in other states, back to the members of NCOC for investment in local, community-based economic, community development, and conservation projects. This feature of the program would create a new funding source for these types of activities in Montana's communities.

**Technical Assessment**

NCOC is comprised of eight Montana nonprofit corporations. NCOC provides an opportunity for landowners; public and private corporations; and tribal, local, and state governments to participate in a market-based conservation program that could help offset the environmental impacts of greenhouse gases. The sequestration of carbon through natural-resource-based programs can help reverse soil, water, and air degradation, while providing enhancement of wildlife and recreational opportunities. The transfer of carbon sequestration units is potentially a new marketable commodity that could provide landowners and communities with a new source of revenue. Technical consulting services are provided by The Sampson Group, Inc., Alexandria, Virginia, and marketing consulting services are provided by Environmental Financial Products LLC, Chicago, Illinois, both of which are recognized internationally as leaders in carbon-market-trading systems and design.

The NCOC program is designed to assist landowners in planning carbon sequestration activities and documenting the resulting carbon sequestration units (CSUs) in a manner that adheres to international standards and protocols, and meets the needs of potential buyers. The program offers participating corporations a cost-effective way to achieve their carbon dioxide emission reduction goals. Those CSUs are packaged into portfolio

units and offered for sale on the emerging private markets. Funds realized from the sale of CSUs provide cost sharing for participating landowners and operating funds for NCOC.

To develop this program, NCOC has conducted workshops and focus groups, engaged teams of experts in developing planning and measurement protocols, and completed the planning and sale of one forestry project. In 1999, the Montana State Legislature approved a $100,000 DNRC Renewable Resource Grant to Lake County Conservation District to support the then Montana Carbon Offset Coalition efforts in developing the first two carbon sequestration pilot projects.

In November 1999, with the assistance of H.B. 223 funds, NCOC held the first National Carbon Sequestration Conference in Missoula, Montana. The conference brought together the scientific, environmental, and market sectors to discuss the development of carbon sequestration projects. More than 150 individuals from across the United States and Canada attended the three-day conference.

In 2000, NCOC completed an urban forestry carbon sequestration project involving nine Montana communities and the Montana Power Company (MPC). Carbon offset credits for MPC from this project have been registered with the U.S. Department of Energy.

In 2001, because of the activities carried out through the Renewable Resource Grant, NCOC completed a pilot carbon credit trade between the Confederated Salish and Kootenai Tribes and Sustainable Forestry Management {SFM,) a London-based firm. The transaction was the first trade in greenhouse gas emission reduction offsets involving carbon sequestration efforts on Native American lands. A total of 47,972 tons of $CO_2$: equivalent will be sequestered over an 80-year period through the reforestation of 250 acres.

Building on the success of the Montana-based group in 2000 and 2001, the Methane and Carbon Sequestration Branch of the U.S. Environmental Protection Agency (EPA) and the federal Natural Resources Conservation Service (NRCS) provided grants totaling $65,000 to NCOC to conduct a pilot greenhouse project.

In April 2002, the Governor's Office began a Carbon Sequestration Working Group involving NCOC; the Conservation Districts Bureau of the Montana Department of Natural Resources and Conservation; the Montana Department of Environmental Quality; researchers from Montana State University (MSU); several Montana power generators; and private, state, and tribal landowners. The purpose of this working group is to create a Montana carbon sequestration initiative designed to pursue federal funding.
The federal proposal would build on the ongoing work of NCOC, enhance the current research efforts of MSU, and provide cooperating Montana power-generating companies an opportunity to be involved in the design of the Montana program. The proposal would seek funding to establish field-scale forestry projects with cooperating power generators, enhance MSU research efforts to allow the development of pilot cropland trades, build upon the initial model contracting report, and increase the number and complexity of pilot agroforestry projects. Successful completion of this federal initiative would complement and enhance the activities proposed in this RDGP grant proposal.

Eight percent of every carbon credit trade will be distributed to the member organizations of NCOC. With NCOC positioned to conduct such trades across the U.S., a new source of community development, economic development, and conservation funding for Montana would be derived from the establishment of a national trading program.

Global climate change is both a national and an international issue. There is a body of evidence of human-induced climate change that could impact major sectors of the world's environment and economy. Data gathered by the international community document that for the last 150 years, the amount of greenhouse gases, carbon dioxide, methane, and nitrous oxide in the atmosphere has been rising. This increase is cited as the principal reason for the projected rise in the temperature of the earth's atmosphere referred to as global warming.

Every nation except the U.S. is supporting Kyoto Protocol. The Bush administration is supporting the development of a U.S. voluntary, market-based climate initiative. Some in Congress are championing a regulatory approach, which would implement a cap-and-trade program. A number of states have implemented

their own emission reduction programs. The question is not whether there will be a national climate change initiative, but when one will be implemented and whether it will be voluntary or regulatory.

Montana has the opportunity to develop intelligent ways to use the emerging market-based tools for implementing voluntary greenhouse gas emission constraints and, in the process, produce new sources of market revenue to support soil and water conservation, improved grazing, and sustainable forest systems.

One of the most difficult challenges facing private landowners is that the costs of owning and managing land must be paid for through the sale of a limited range of marketable products, while many of the land's outputs are public goods and services that bring no revenue to the owner. Thus, forestland is primarily supported by the sale of timber products, in spite of the fact that it may produce a regulated flow of clean water that would have a high dollar value if a market existed. One of the major topics in conservation circles has been how to help landowners realize some economic return from the provision of those "public goods" such as clean water, wildlife habitat, scenic views, etc., that in general carry no market opportunity. One result of these concerns has been a wide array of public policies and programs designed to provide technical and financial assistance, tax breaks, or other public incentives to encourage the production of desired environmental values.

Marketable CSUs may offer landowners an opportunity to realize revenue from a new source. If an industry is required under national or international regulations to reduce carbon emissions, and if a trading system is allowed as one means of meeting those reductions, it would be possible for landowners to produce and market an important new environmental service. The CSUs produced from forestry projects would need to compete in the marketplace with CSUs produced from other sources. As long as production of CSUs is profitable for the landowner, and competitive with other options, industry would find them an economical way to meet their emission reduction needs. The result could be that the landowner would realize an additional income opportunity that would enhance the health and sustainability of the ecosystem, while the regulated industry could reduce carbon emissions in the most cost-effective manner.

The international carbon credit market is already emerging. Over the past two years, companies such as DuPont and BP Amoco have undertaken carbon trading. Intensive preparation is being made by carbon funds such as the World Bank, and by countries such as the United Kingdom, Australia, Norway, and the Netherlands. The importance of positioning Montana to benefit from the carbon market is heightened by the fact that the carbon credit market is already evolving. In order to take advantage of the above opportunities and the leadership position of NCOC in this market-based approach, Montana should continue to develop this unique program. The need and urgency are created by the fact that, without state support such as this grant, the Montana citizens who have brought the program to this point would be unable to compete with other state-supported efforts in the U. S. Montana would lose its ability to influence national policy if it sits on the sidelines, and Montana landowners and power generators would be held to standards set by others.

**Financial Assessment**

The total overall budget for this project consists of the following:

| | RDGP | Matching Funds | Total |
|---|---|---|---|
| Salaries and Wages | $ 37,500 | $ 0 | $ 37,500 |
| Employee Benefits | $ 12,500 | $ 0 | $ 12,500 |
| Contracted Services | $ 166,000 | $ 156,000 | $ 322,000 |
| Supplies and Materials | $ 8,000 | $ 5,000 | $ 13,000 |
| Communications | $ 8,000 | $ 10,000 | $ 18,000 |
| Travel | $ 20,000 | $ 20,000 | $ 40,000 |
| Rent and Utilities | $ 29,000 | $ 0 | $ 29,000 |
| Equipment | $ 9,000 | $ 0 | $ 9,000 |
| Miscellaneous | $ 10,000 | $ 0 | $ 10,000 |
| **Total** | **$ 300,000** | **$ 191,000** | **$ 491,000** |

The Growing Carbon project reflects only the costs of staffing and operation of NCOC for a two-year period. The RDGP grant is intended to provide financing to NCOC for program operations. The budget reflects the fact that the Montana office of NRCS has been providing all office space, equipment, miscellaneous office supplies, and access to communication equipment up this point. This in-kind match will cease when NCOC moves from a design phase into active participation in the market.

Budget costs do not reflect the expected ongoing planning, demonstration, and research expenditures of members of the Governor's Carbon Sequestration Working Group, or any in-kind provided by cooperating federal and state agencies or members of NCOC. The budget also does not reflect the existing and potential state and federal grants NCOC or other collaborators are working with or expect to obtain in the future.

Any estimate made regarding other potential expenditures at this time would be highly speculative. At the same time, it must be noted that NCOC, the Governor's Carbon Sequestration Working Group, other cooperating agencies, and many of NCOC's contractors are incurring substantial ongoing expenditures towards development of the program.

Rather than attempting to capture this yet unknown and diverse funding potential, the only match identified in the budget is revenue expected from carbon sequestration credit sales projected for the second year of the project. That revenue is estimated to be $3 million (1 million tons of $CO_2$ equivalent at $3/ton). Of this amount, $191,000 is pledged as matching funds to the RDGP grant.

If all of the projects were forestry projects, it would require the planning and sale of approximately 5,000 acres to achieve 1 million tons of CO2 equivalent. NCOC states that it currently has more than this amount of acreage in the planning stage.

**Environmental Evaluation**

A voluntary, market-based carbon credit trading program would allow participants to offset the environmental impact of carbon dioxide emissions while providing local environmental benefits. Carbon sequestration through vegetative processes creates local environmental benefits of wildlife habitat improvement, improved soil quality, and soil erosion prevention while addressing the global impacts of greenhouse gas emissions.

**Public Benefits Assessment**

The potential size of this new market combined with the NCOC's national leadership in this area creates the potential for the development of a new and significant pool of grant funds for Montana communities.

Eight percent of every trade in Montana or other states will be redistributed back to the members for investment in community-based projects in Montana. This will effectively create a new, funding source for rural economic development and conservation projects in Montana independent of federal or state dollars.

**Recommendation**

A grant of up to $ 150,000 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

**Project No. 12**

| | | |
|---|---|---|
| **Applicant Name** | Fergus County Conservation District | |
| **Project Name** | Central Montana Aquifer | |
| **Amount Requested** | $ 299,500 | |
| **Other Funding Sources** | $ 20,000 | Applicant |
| | $ 13,134 | Montana Bureau of Mines and Geology |
| | $ 117,014 | Well Owners |
| **Total Project Cost** | $ 449,648 | |
| **Amount Recommended** | $ 150,000 | |

**Project Abstract** (prepared and submitted by applicant)

In accordance with DNRC's Groundwater Plan, Issue 3, "Individuals, watershed groups, and other water users should be encouraged to define and protect local groundwater resources..." Fergus County Conservation District (CD) proposes to continue its project to conserve the high quality artesian groundwater resources by reducing surface flow from artesian wells. This study would also characterize the hydrology of artesian groundwater in central Montana. Historically, these wells have had high pressure heads with resulting high rates of flow. Water pressure and lack of equipment and technology prevented many wells from being properly completed. Some artesian wells have flowed continuously for as many as 70 years. Other wells have experienced so much pressure depletion that they now are pumped, further reducing aquifer pressure. Declining artesian pressure is widely reported by landowners in the study area. In effect, the groundwater has been "mined" by years of uncontrolled flow. The result is that artesian aquifers are being depleted faster than they can be recharged.

The goal of Fergus County CD as project sponsor is to continue conducting specific well completion techniques to stop uncontrolled flow and measurably increase aquifer pressure. Many artesian wells will require rehabilitation so that well owners can control the rate and timing of water flow to coincide with water needs. Grant money would conserve valuable artesian water resources, improve the productivity of the aquifers, and restore reliable water supplies for future ranching, farming, and domestic needs.

The project area includes all of Fergus County. Individual wells to be included and/or repaired would be determined by the project coordinator, working together with conservationists and well owners. Benefits of the project would include conservation of valuable and extensive artesian water resources, education of well owners and water users on the benefits of conservation, and development of effective methods of well rehabilitation for application in areas experiencing similar problems. The project is scheduled to be finished within two years.

**Technical Assessment**

The purpose of this project is conservation of valuable artesian groundwater resources in Fergus County, Montana. RDGP funds would be used to inventory and rehabilitate/plug artesian surface flow from selected wells. Declining artesian pressure is widely reported by well owners in Fergus County and other areas in eastern and central Montana. In effect, the groundwater is being mined by uncontrolled flow, which continually reduces the pressure in the aquifer. The result is that artesian aquifers are being depleted faster than they can be recharged.

The goal of Fergus County CD as the project sponsor is to work with the Montana Bureau of Mines and Geology (MBMG) and landowners to identify uncontrolled flowing wells and conduct well completion techniques to regulate or stop the flow in order to increase aquifer pressure. Potential actions include lining wells, plugging wells, or winterizing wells. The application indicates that 2,740 wells are present in the project area. Also, there are 27 oil and gas wells that have been released to landowners and 48 oil and gas wells of unknown use.

A map that was included in the application shows about 60 existing wells from a 1999 RDGP-funded project, but does not appear to locate all of the flowing wells in Fergus County that are uncontrolled or identify which ones were oil and gas exploration wells. The application did outline local interest in the project. Eighteen landowners

attended a public meeting sponsored by the district and signed a sheet indicating their desire to participate in the project.

The recommended funding level for this project would address oil and gas wells, but not wells drilled by private landowners for stockwater use. The specific wells to be rehabilitated or plugged would be determined by the well owners and the Fergus County CD Board of Supervisors, working with MBMG and the project coordinator. Benefits of the project would include (1) conservation of valuable and extensive artesian water resources; (2) restoration of reliable water supplies for future ranching, farming, and domestic needs; (3) education of well owners and water users on the benefits of conservation; and (4) use of proven methods of well rehabilitation from similar projects in Petroleum County and an ongoing project in Fergus County. The project would be completed in two years.

Similar projects were funded in the past. In 1995 and again in 1997, RDGP provided grant funds to Petroleum County CD ($232,247) and Fergus County CD ($150,000) to establish pilot programs for controlling artesian flows from wells. These projects were conducted in cooperation with MBMG. The Petroleum County CD project was completed in 1998; the results were encouraging, and the methods for controlling artesian flow were proven effective at a minimal cost. A total of $139,374 was turned back to DNRC on this project. The Fergus County CD project is ongoing, and $105,824 remained in the RDGP budget as of August 1, 2002. This project also promises similar results. Delays in getting the Fergus County CD project completed are apparently due to the lack of a contractor to perform work that is already planned and ready to be implemented. In general, these projects should demonstrate the benefits to private well owners and encourage them to conserve water from uncontrolled flowing wells without the benefit of RDGP funds.

This is the second request from the Fergus County CD for funding for this project. The first request was recommended for funding as a pilot program for conserving groundwater and aquifer pressure. One past concern that should have been included as part of this second funding request is mapping the flowing wells in the project area. A new geographic information system (GIS) map should be prepared that shows where both oil and gas and domestic wells with uncontrolled artesian flow, are located and who owns them, so the owners can be contacted.

A current concern about this application is that funding is being requested to address both oil and gas wells gifted to landowners and wells drilled by landowners for stockwater use. Most likely, many artesian wells require rehabilitation, and the number of wells is likely more than RDGP can support through a "Crucial State Need" project category. However, former oil and gas wells are clearly potential sites for "Mineral Development" RDGP funding. Based on reviewing the application and discussions with the project sponsor, the recommended funding should focus on only those wells associated with oil and gas development. Fergus County CD should consider this a demonstration project for other well owners and encourage them to rehabilitate their own wells without RDGP funding. Lastly, the project should be considered a partnership effort with Judith Basin CD, which submitted a very similar application.

Another concern is the availability of contractors to do the work. Their unavailability caused delay in getting the first Fergus County CD project completed, and this would likely be the case for this project. To that end, only partial funding is recommended because the funding is being used at a relatively slow rate. RDGP funds should not be tied up if they can be used elsewhere in the state.

In order to attain the project goal stated above, four principal objectives for the project were identified:

1. Assessment, outreach activities to partner with landowners, and discuss rehabilitation measures
2. Well repair and rehabilitation
3. Monitoring of conservation activities (pressure measurements)
4. Education and reporting of data

In addition to taking no action, two alternatives were considered for the project: (1) implementing the recommended project, and (2) developing legislation to force wells owners to address flowing well problems. Legislation requiring flowing wells have controls that conserve groundwater already exists in Montana water law

(85-2-505, MCA). This statute states that no groundwater may be wasted. DNRC shall require "all flowing well to be so capped or equipped with valves that the flow of water can be stopped when the water is not being put to beneficial use. Likewise, both flowing and nonflowing wells must be so constructed and maintained as to prevent the waste, contamination, or pollution of groundwater through leaky casings, pipes, fittings, valves, or pumps either above or below the land surface." Thus, landowners are already responsible for not wasting groundwater. If well owners are unwilling to stop uncontrolled artesian flow from their wells, the above statutes should be enforced. At this time, it is not clear who is responsible for enforcing the statute.

In terms of the oil and gas wells, RDGP funding for their rehabilitation is recommended because they were part of mineral development, and were transferred to landowners who may not have understood the liability issues associated with controlling artesian flow. Therefore, the oil and gas portion of the flowing wells is recommended for RDGP funding.

**Financial Assessment**

The total overall budget for this project consists of the following:

| | RDGP | Matching Funds | Total |
|---|---|---|---|
| Salaries and Wages | $ 20,000 | $ 20,000 | $ 40,000 |
| Contracted Services | $ 267,960 | $ 130,148 | $ 398,108 |
| Supplies and Materials | $ 3,000 | $ 0 | $ 3,000 |
| Travel | $ 4,040 | $ 0 | $ 4,040 |
| Equipment | $ 2,500 | $ 0 | $ 2,500 |
| Miscellaneous (brochure, map) | $ 2,000 | $ 0 | $ 2,000 |
| **Total** | **$ 299,500** | **$ 150,148** | **$ 449,648** |

Total RDGP funding that is being requested is $299,500 with most of the funding being requested for construction activities. Salaries and wages requested include those for the project administrator for oversight and project management. Contracted services include the conservation district technician, MBMG professional staff, and well rehabilitation contractor services. Supplies and materials include $3,000 in laboratory expenses. Equipment costs include rental fees for a downhole camera. Miscellaneous costs include $2,000 for an educational brochure, maps, and report duplication.

Unit costs for the project administrator are not clear, and a lump sum of $20,000 is given for a two-year period. The wage rate and the number of hours, with description of the tasks, need to be provided if RGDP funding is approved. In general, administration costs appear to be high and should be reduced proportionately for the recommended funding level. Unit costs for consulting fees, laboratory analysis, and additional costs appear to be reasonable and adequate for a job of this nature. Construction activities are not well defined in terms of individual well costs. A range of potential costs is provided from several hundred to tens of thousands of dollars, with an average cost of about $10,000 per well, according the Montana Board of Oil and Gas Conservation. This level of detail is reasonable considering that the current strategy does not specify which wells or how each well would be rehabilitated or plugged. Nonetheless, without more budget detail, it is difficult to determine whether the construction activities are reasonable. In general, the project approach requires that RDGP assume that Fergus County CD would approve plans that would be effective and economical.

The recommended funding level substantially reduces the proposed budget to focus only on oil and gas wells in Fergus County. The funding also should be used for education, outreach, and development of a GIS map of wells. If these funds are approved, Fergus County CD would need to prepare a scope of work that is proportioned to the reduced budget amount.

**Environmental Evaluation**

The project is designed to mitigate damage to artesian aquifers. No long-term adverse environmental impacts are anticipated in conjunction with the proposed rehabilitation. Short-term impacts might include limited soil and

vegetation disturbances at well sites, but those impacts are anticipated to be temporary. Emissions would be generated from combustion engines and vehicular traffic, and the potential for leaking oil and other fluids on the ground surface would increase. These impacts would be relatively minor and could be easily mitigated or avoided by using well-maintained equipment, dust suppression, and site grading and restoration after the project is complete.

**Public Benefits Assessment**

Benefits could be substantial to individual landowners participating in the project if artesian flow is reestablished, increased, or controlled. Collateral benefits could also be realized by adjacent landowners if the aquifer pressure increase is fairly widespread and improves pressure in nearby wells. Benefits associated with increased aquifer pressure include ensuring that the wells continue to flow when needed and avoiding the potential need for installing pumps and incurring energy costs for stockwatering. Also, the potential expense of drilling new wells may be avoided if damaged wells could be rehabilitated. Educational benefits would be more widespread, potentially regional and hopefully statewide, as in the case of earlier pilot projects located in Petroleum County.

**Recommendation**

DNRC recommends funding in the reduced amount of $150,000 based on the approximate number of oil and gas wells that may need rehabilitation, general costs of developing a GIS map of uncontrolled flowing wells in the district, and the funding still available through the 1999 RDGP grant. Most of the funds should be directed to rehabilitating former oil and gas wells only and conducting an education and outreach effort to encourage well owners to take responsibility for not wasting groundwater, in accordance with Montana law. Education efforts should emphasize that Montana law requires well owners to be responsible and conserve groundwater resources by not wasting water from artesian wells or unnecessarily diminishing aquifer pressure. The project sponsor will need to re-scope much of the project funding, administration fees, and matching funds, if the reduced amount of funding is approved for the project.

**Project No. 13**

| | | |
|---|---|---|
| **Applicant Name** | Judith Basin Conservation District | |
| **Project Name** | Judith Basin Aquifer Restoration and Conservation | |
| **Amount Requested** | $ 300,000 | |
| **Other Funding Sources** | $ 20,000 | Applicant |
| | $ 18,848 | Montana Bureau of Mines and Geology |
| | $ 110,961 | Well Owners |
| **Total Project Cost** | $ 449,809 | |
| **Amount Recommended** | $ 70,000 | |

**Project Abstract** (prepared and submitted by applicant)

Judith Basin Conservation District (CD) proposes to begin its project to conserve the high quality artesian groundwater resources by reducing surface flow from artesian wells. This study would also characterize the hydrology of artesian groundwater in central Montana. Historically, these wells have had highpressure heads with resulting high rates of flow. The water pressure, and lack of equipment and technology, prevented many wells from being properly completed. Some artesian wells have flowed continuously for as many as 70 years. Other wells have experienced so much pressure depletion that they now are pumped, further reducing aquifer pressure. Declining artesian pressure is widely reported by landowners in the study area. In effect, the groundwater has been "mined" by years of uncontrolled flow. The result is that artesian aquifers are being depleted faster than they can be recharged.

The goal of Judith Basin CD as project sponsor is to continue conducting specific well completion techniques to stop uncontrolled flow and measurably increase aquifer pressure. Many artesian wells will require rehabilitation so that well owners can control the rate and timing of water flow to coincide with water needs. Grant money would conserve valuable artesian water resources, improve the productivity of the aquifers, and restore reliable water supplies for future ranching, farming, and domestic needs.

The project area includes Judith Basin County. Individual wells to be included and/or repaired would be determined by the conservation district, working together with conservationists and well owners. Benefits of the project would include conservation of valuable and extensive artesian water resources, education of well owners and water users on the benefits of conservation, and development of effective methods of well rehabilitation for application in areas experiencing similar problems. The project is scheduled to be completed within two years.

**Technical Assessment**

The purpose of this project is conservation of valuable artesian groundwater resources in Judith Basin, Montana. RDGP funds would be used to inventory and rehabilitate/plug artesian surface flow from selected wells. Declining artesian pressure is widely reported by well owners in Judith Basin County and other areas in Eastern and central Montana. In effect, the groundwater is being mined by uncontrolled flow, which continually reduces the pressure in the aquifer. The result is that artesian aquifers are being depleted faster then they can be recharged.

The goal of Judith Basin CD as the project sponsor is to work with the Montana Bureau of Mines and Geology (MBMG) and landowners to identify uncontrolled flowing wells and conduct well completion techniques to regulate or stop the flow in order to increase aquifer pressure. Potential actions include lining wells, plugging wells, or winterizing wells. The application indicates that 1,170 wells are present in the project area. Also, there are 7 oil and gas wells that have been release to landowners and 9 oil and gas wells of unknown use.

Previous work conducted in Judith Basin County indicates there are at least 141 flowing wells that were mapped by Feltis (1977) and Zimmerman (1966). These data are probably outdated and should be revised as part of this project. The application did outline local interest in the project. In November 2001, over 50 landowners attended a meeting sponsored by the Judith Basin CD. With the help of MBMG, the benefits of protecting groundwater resources by conserving flow from wells were presented. Based on that meeting, 26 landowners wanted to participate in the effort.

The recommended funding level for this project would address oil and gas wells, but not wells drilled by private landowners for stockwater use. The specific wells to be rehabilitated or plugged would be determined by the well owners and the Judith Basin CD Board of Supervisors, working with MBMG and the project coordinator. Benefits of the project would include (1) conservation of valuable and extensive artesian water resources; (2) restoration of reliable water supplies for future ranching, farming, and domestic needs; (3) education of well owners and water users on the benefits of conservation; and (4) use of proven methods of well rehabilitation from similar projects in Petroleum and Fergus Counties. The project would be completed in two years.

Similar projects were funded in the past. In 1995 and again in 1997, RDGP provided grant funds to Petroleum County CD ($232,247) and Fergus County CD ($150,000) to establish pilot programs for controlling artesian flows from wells. These projects were conducted in cooperation with MBMG. The Petroleum County CD project was completed in 1998; the results were encouraging, and the methods for controlling artesian flow were proven effective at a minimal cost. A total of $139,374 was turned back to DNRC on this project. The Fergus County CD project is ongoing, but promises similar results. Delays in getting the Fergus County CD project completed are apparently due to the lack of a contractor to perform work that is already planned and ready to be implemented. In general, these projects should demonstrate the benefits to private well owners and encourage them to conserve water from uncontrolled flowing wells without the benefit of RGDG funds.

This is the second request from Judith Basin CD for funding for this project. The first request was not recommended for funding. However, two of the three concerns with past applications were satisfactorily addressed in the revised application. One remaining concern relates to updating the available mapping of flowing wells in the project area. A new geographic information system (GIS) map should be prepared that shows the

location of both oil and gas and domestic wells with uncontrolled artesian flow, and who owns them, so the owners can be contacted.

A current concern about this application is that funding is being requested to address both oil and gas wells gifted to landowners and wells drilled by landowners for stockwater use. Most likely, many artesian wells require rehabilitation and the number of wells is likely more than RDGP can support through a "Crucial State Need" project category. However, former oil and gas wells are clearly potential sites for "Mineral Development" RDGP funding. Based on reviewing the application and discussions with the project sponsor, the recommended funding should focus on only those wells associated with oil and gas development. Judith Basin CD should consider this a demonstration project for other well owners and encourage them to rehabilitate their own wells without RDGP funding. Lastly, the project should be considered a partnership effort with Fergus County CD, which submitted a very similar application.

Another concern is the availability of contractors to do the work. Their unavailability caused the delay in getting the first Fergus County CD project competed and this would likely be the case for this project. To this end, only partial funding is recommended because it is anticipated that the funding would be used at a relatively slow rate. RDGP funds should not be tied up if they can be used elsewhere in the state.

In order to attain the project goal stated above, four principal objectives for the project were identified:

1. Assessment, outreach activities to partner with landowners, discuss rehabilitation measures
2. Well repair and rehabilitation
3. Monitoring of conservation activities (pressure measurements)
4. Education and reporting of data

In addition to taking no action, two alternatives were considered for the project: (1) implementing the recommended project, and (2) developing legislation to force wells owners to address flowing well problems. Legislation requiring flowing wells have controls that conserve groundwater already exists in Montana water law (85-2-505, MCA). This statute states that no groundwater may be wasted. DNRC shall require "all flowing well to be so capped or equipped with valves that the flow of water can be stopped when the water is not being put to beneficial use. Likewise, both flowing and nonflowing wells must be so constructed and maintained as to prevent the waste, contamination, or pollution of groundwater through leaky casings, pipes, fittings, valves, or pumps either above or below the land surface." Thus, landowners are already responsible for not wasting groundwater. If well owners are unwilling to stop uncontrolled artesian flow from their wells, the above statutes should be enforced. At this time, it is not clear who is responsible for enforcing the statute.

In terms of the oil and gas wells, RDGP funding for their rehabilitation is recommended because they were part of mineral development, and were transferred to landowners who may not have understood the liability issues associated with controlling artesian flow. Therefore, the oil and gas portion of the flowing wells is recommended for RDGP funding.

**Financial Assessment**

The total overall budget for this project consists of the following:

| | RDGP | Matching Funds | Total |
|---|---|---|---|
| Salaries and Wages | $ 20,000 | $ 20,000 | $ 40,000 |
| Contracted Services | $ 265,460 | $ 129,809 | $ 395,269 |
| Supplies and Materials | $ 3,000 | $ 0 | $ 3,000 |
| Travel | $ 7,040 | $ 0 | $ 7,040 |
| Equipment | $ 2,500 | $ 0 | $ 2,500 |
| Miscellaneous (brochure, map) | $ 2,000 | $ 0 | $ 2,000 |
| **Total** | **$ 300,000** | **$ 149,809** | **$ 449,809** |

Total RDGP funding that is being requested is $300,000 with most of the funding being requested for construction activities. Salaries and wages requested include those for the project administrator for oversight and project management. Contracted services include the conservation district technician, MBMG professional staff, and well rehabilitation contractor services. Supplies and materials include $3,000 in laboratory expenses. Equipment costs include rental fees for a downhole camera. Miscellaneous costs include $2,000 for an educational brochure, maps, and report duplication.

Unit costs for the project administrator are not clear, and a lump sum of $20,000 is given for a two-year period. The wage rate and the number of hours, with a description of the tasks, need to be provided if RGDP funding is approved. Also, these costs appear to be fairly high and should be reduced proportionately for the recommended funding level. Unit costs for consulting fees, laboratory analysis, and additional costs appear to be reasonable and adequate for a job of this nature. Construction activities are not well defined in terms of individual well costs. A range of potential costs is provided from several hundred to tens of thousands of dollars, with an average cost of about $10,000 per well, according the Montana Board of Oil and Gas Conservation. This level of detail is reasonable considering that the current strategy does not specify which wells or how each well would be rehabilitated or plugged. Nonetheless, without more budget detail, it is difficult to determine whether the construction activities are reasonable. In general, the project approach requires that RDGP assume that the conservation district would approve plans that would be effective and economical.

The recommended funding level substantially reduces the proposed budget to focus only on oil and gas wells in Judith Basin County. The funding also should be used for education, outreach, and development of a GIS map of wells. If these funds are approved, Judith Basin CD would need to prepare a scope of work that is proportioned to the reduced budget amount.

**Environmental Evaluation**

The project is designed to mitigate damage to artesian aquifers. No long-term adverse environmental impacts are anticipated in conjunction with the proposed rehabilitation. Short-term impacts might include limited soil and vegetation disturbances at well sites, but those impacts are anticipated to be temporary. Emissions would be generated from combustion engines and vehicular traffic, and the potential for leaking oil and other fluids on the ground surface would increase. These impacts would be relatively minor and could be easily mitigated or avoided by using well-maintained equipment, dust suppression, and site grading and restoration after the project is complete.

**Public Benefits Assessment**

Benefits could be substantial to individual landowners participating in the project if artesian flow is reestablished, increased, or controlled. Collateral benefits could also be realized by adjacent landowners if the aquifer pressure increase is fairly widespread and improves pressure in nearby wells. Benefits associated with increased aquifer pressure would include ensuring that the wells continue to flow when needed and avoiding the potential need for installing pumps and incurring energy costs for stockwatering. Also, the potential expense of drilling new wells may be avoided if damaged wells could be rehabilitated. Educational benefits would be more widespread, potentially regional and hopefully statewide, as in the case of earlier pilot projects located in Petroleum County.

**Funding Recommendation**

DNRC recommends funding in the reduced amount of $70,000 based on the approximate number of oil and gas wells that may need rehabilitation and the general costs of developing a GIS map of uncontrolled flowing wells in the district. Most of the funds should directed to rehabilitating former oil and gas wells only and conducting an education and outreach effort to encourage well owners to take responsibility for not wasting groundwater, in accordance with Montana law. Education efforts should emphasize that Montana law requires well owners to be responsible and conserve groundwater resources by not wasting water from artesian wells or diminishing aquifer pressure unnecessarily. The project sponsor will need to re-scope much of the project funding, administration fees, and matching funds, if the reduced amount of funding is approved for the project.

## Part 2. Projects Not Recommended for Funding

| | | |
|---|---|---|
| **Applicant Name** | Butte-Silver Bow Local Government | |
| **Project Name** | Butte Native Plant Propagation Nursery | |
| **Amount Requested** | $ 167,337 | |
| **Other Funding Sources** | $ 55,186 | Applicant |
| **Total Project Cost** | $ 222,523 | |
| **Amount Recommended** | $ 0 | |

**Project Abstract** (prepared and submitted by applicant)

Butte's natural ecosystem has been negatively impacted from over 100 years of mining and smelting activities. As a result, more than 200 individual waste rock and tailings dumps occupy land where a native, sub-alpine vegetation community once flourished. Many of these dumps have been reclaimed with revegetated soil caps, replacing diverse native vegetation with more aggressively establishing cultivars in the interest of providing immediate soil stability to prevent erosion and weed invasion.

With erosion control serving as the primary objective for revegetation strategy, native species composition was essentially omitted when a seed mix was selected. This limitation of the reclamation vegetation to only a handful of species has left the community with hundreds of acres of unattractive "wheat fields" as its open space areas, devoid of native diversity and any aesthetic value. This situation has caused continual complaints from citizens who live near drab reclaimed areas and from others who currently favor recreating in adjacent areas outside of town where mining never impacted the environment.

The goal of this project is to reestablish native species diversity in the open space areas of Butte's community to improve aesthetics and provide small-wildlife-viewing opportunities. The goal would be accomplished by constructing a greenhouse and nursery where, under the direction of the Butte-Silver Bow Planning Department, seeds and plant tissues collected from local, native sources would be propagated for stock to plant on various reclaimed areas.

It is anticipated that, once funds are awarded, the greenhouse and nursery would be constructed in 2003 with first-year stock ready for planting on selected sites in 2004. The findings from an independently funded pilot study, where a variety of seeds and cuttings from local species were collected and propagated in an off-site native nursery, are being used to determine the proper strategy for ensuring the success of the project.

**Technical Assessment**

As stated in the application, the principal goal of this project is to improve the revegetation of reclaimed sites in Butte by increasing native species diversity and long-term stability of vegetation through incorporation of native seed and plant propagation strategies into current reclamation practices. Accomplishing this goal would make reclaimed open space more comparable to the native ecosystem that was diminished or destroyed due to mining, but which is present on several local sites where mining never occurred. This in turn would increase the overall reclaimed plant community's tolerance and adaptability to Butte's climatic conditions, improve aesthetics, restore wildlife habitat, and improve recreational values.

The problem as stated in the proposal appears to be the lack of plant diversity and the invasion of non-native species that diminish the aesthetic value and wildlife habitat of Butte's open spaces. The proposal does not adequately define how the project would convert these unsatisfactory open spaces into the desired diverse native terrestrial ecosystem. The proposal should give examples of satisfactory and unsatisfactory previous reclamation efforts. What are the plants and seed mixtures that have or have not produced the desired result?

The applicant does not reference the species that are contained in seed mixes or containerized stock planted at either successfully or unsuccessfully reclaimed sites in Butte. The proposal briefly references the development of

acid tolerant cultivars (DATC) project funded by RDGP in 1997 and states that "the DATC project embarked on a native seed collection and growing effort a few years back on similar mining-impacted sites near Anaconda and is experiencing success." No effort has been made to contact DATC project personnel. The DATC project has experienced both success and failure in its efforts to produce native seed and plants and subsequently revegetate mine-impacted lands. Additionally, no mention is presented of the reclamation efforts by the Montana State University Reclamation Research Unit; Schafer and Associates; Bitterroot Restoration, Inc.; and ARCO Environmental Remediation, LLC.

The goal as stated is "to reestablish native species diversity in the open space areas of Butte's community to improve aesthetics and provide small-wildlife-viewing opportunities." According to the proposal, the goal would be accomplished by "constructing a greenhouse and nursery where...seeds and plant tissue collected from local native sources would be propagated...." The proposal does not describe the objectives required to meet the project's goal. The project proposal falls short because it encompasses only the greenhouse construction, seed and plant collection, and early stages of propagation. It does not describe how species diversity and aesthetics would be accomplished.

Other alternatives would be to contract the growing of plants or lease greenhouse space. Additionally, the DATC project already has available seed and plant tissue that was collected in the Butte/Anaconda area and that could potentially be propagated at the proposed nursery or some other nursery. It is also unclear how these open spaces are or would be utilized. If these areas are to be used as city parks, perhaps a combination of native and non-native plants would be appropriate.

In the proposal, it is assumed that local ecotypes would solve the revegetation problem, when in fact the problem may result from planting techniques, timing, site preparation, soil amending, stand care, or maintenance. Other technical issues that have not been addressed, include the following.

- What species will be grown?
- Where will they be collected?
- Where will the seed be cleaned?
- Where will the seed be stored?
- What is the schedule for growing and planting?
- Who will do the planting design work?
- How will planting be accomplished?
- How will the plantings be maintained?
- How will weeds be controlled?
- How will the plantings be monitored?
- How will the native plant nursery support itself in the long term?
- How will future funding be obtained?

This project has the potential to have merit, but has not been researched or coordinated with other possible cooperators sufficiently. The total costs and benefits of this effort need additional planning and design based on the results of other previous and ongoing reclamation funded by RDGP, EPA, and others.

**Financial Assessment**

The total overall budget for this project consists of the following:

| | RDGP | Matching Funds | Total |
|---|---|---|---|
| Salaries and Wages | $ 21,046 | $ 29,568 | $ 50,614 |
| Employee Benefits | $ 7,155 | $ 10,054 | $ 17,209 |
| Contracted Services | $ 115,000 | $ 0 | $ 115,000 |
| Travel | $ 0 | $ 2,000 | $ 2,000 |
| Equipment | $ 24,136 | $ 0 | $ 24,136 |
| Miscellaneous | $ 0 | $ 13,564 | $ 13,564 |
| **Total** | **$ 167,337** | **$ 55,186** | **$ 222,523** |

Lack of detail makes the budget difficult to assess. Other alternatives should be explored, and a detailed cost comparison should be presented for each. Coordinating with other projects and agencies could possibly decrease costs, but the extent is unknown. Further elaboration concerning contracted costs and greenhouse operational cost is needed.

**Environmental Evaluation**

No long-term adverse impacts on the environment are anticipated. Impacts from short-term construction activities can be easily mitigated by careful planning and supervision.

**Public Benefits Assessment**

The public benefits center primarily on reestablishment of vegetation and improved aesthetics in the Butte community.

**Recommendation**

This project is not recommended for funding.

**Applicant Name** Butte-Silver Bow Local Government
**Project Name** Excelsior Reclamation

**Amount Requested** $ 129,497
**Other Funding Sources** $ 49,899 Applicant
**Total Project Cost** $ 179,396

**Amount Recommended** $ 0

**Project Abstract** (prepared and submitted by applicant)

The principal purpose of this project is to reclaim approximately 4 acres of land impacted by mineral development in the urban corridor of Butte, Montana. Although the property surrounding the project site has been reclaimed in the past decade, primarily through the Superfund cleanup program, the subject property has not been addressed. The RDGP grant, as part of a cooperative effort, would be a vital, instrumental component of a successful project.

The project site has been clearly impacted by mineral development, yet the impacted acres have been excluded from previous reclamation actions. The land immediately adjacent to the east of the site is the Travona Mineyard, a 16.6-acre area that was reclaimed under the Superfund Program in 1990. The soils were impacted by heavy metals and contributed to surface water contamination during storm events. The site was reclaimed with a

standard, clean-soil cap and revegetation, and has generally performed well since the installation. The west border of the site is Excelsior Street, a main arterial road from the Interstate to the westside neighborhoods in Butte. The project site is a sliver of land between the reclaimed mineyard and the public roadway.

The main challenge of the reclamation project will be to address the steep topography that characterizes the land and establish erosion-control vegetation. The project will involve changing the contours, importing clean topsoil, and then adding compost to existing soils to enhance plant growth. The regrading and vegetation work should result in a stable landscape that will reduce erosion, particularly during storm events. The reclamation will also be designed to minimize the costs of long-term maintenance of the project site.

The reclamation of this property will have tremendous positive impact on the neighborhood and an area that is adjacent to one of the primary gateways to the urban area in Butte.

**Technical Assessment**

The main goals of this project will be to mitigate adverse environmental impacts present at the site and help prevent pollution from storm water runoff.

The main objectives will be to reduce erosion, particularly during storm events, and improve the visual appearance of the landscape. They include changing the steep slopes that characterize major portions of the project site, enhancing and improving existing vegetation, establishing new vegetation in barren areas on the site, and installing storm water control structures, as necessary. The project would involve changing contours, importing clean fill materials, and adding compost to existing soils to enhance plant growth. Another objective of the reclamation is to install measures that would minimize long-term maintenance costs.

Construction is estimated to take approximately 12 weeks, and activities would include:

- Clear and grub; remove all loose debris, and perform general cleanup
- Salvage topsoil for reuse
- Regrade site to desired elevations
- Install curb and gutter along Excelsior Street to control storm water entering the site
- Install weed control fabric and rock along the steep slope at the north end of the site where there is insufficient public land to allow recontouring
- Import compost to achieve the desired nutrient mix in soils (fertilize and mulch)
- Enhance existing vegetation
- Seed barren surfaces with native plants and grasses that do not require watering
- Install 24 new trees within the project
- Install drip irrigation system (from the 6-inch water main on the south side of Platinum Street) to water new trees
- Reinstall fences, or install new site management features
- Prepare a final report, including as-built drawings of the completed work

The applicant has been unsuccessful in securing funds from Montana's Mine Waste Cleanup Bureau or the federal Superfund. These programs typically deal with safety hazards, and threats to human health or the environment. The heavy metals and arsenic levels found on-site do not trigger action from the U.S. Environmental Protection Agency (EPA) Superfund. RDGP prioritizes projects in similar fashion, but allows funding for this type of project. The construction methods are straightforward and standard practice in the construction industry and present no difficulty in implementing.

**Financial Assessment**

The total overall budget for this project consists of the following:

| | RDGP | Matching Funds | Total |
|---|---|---|---|
| Salary and Wages | $ 6,041 | $ 16,292 | $ 22,331 |
| Employee Benefits | $ 2,054 | $ 5,540 | $ 7,596 |
| Contracted Services | $ 121,402 | $ 22,080 | $ 143,482 |
| Miscellaneous | $ 0 | $ 5,987 | $ 5,987 |
| **Total** | **$ 129,497** | **$ 49,899** | **$ 179,396** |

The costs are well documented and based on actual bid tabulations from recent, similar projects. They are reasonable for the scope of work proposed.

**Environmental Evaluation**

The project is not expected to have any long-term adverse environmental impacts. It is anticipated that construction related to the implementation of this project would be completed in a single field season. Therefore, impacts associated with construction activities would be considered short-term and should not significantly impact human health or the environment. Short-term impacts would be fugitive dust and noise. Proper dust control measures such as using water sprays and limiting work to daylight hours would lessen these impacts.

**Public Benefits Assessment**

Beyond the environmental improvements, conducting the project would increase the likelihood that the surrounding properties can be redeveloped and help create significant economic benefits to the community as that land is returned to productive use.

**Recommendation**

This project is not recommended for funding.

| | | |
|---|---|---|
| **Applicant Name** | Lewis and Clark County | |
| **Project Name** | Cave Gulch Watershed Restoration | |
| **Amount Requested** | $ 300,000 | |
| **Other Funding Sources** | $ 13,030 | Montana Department of Environmental Quality |
| | $ 25,000 | U.S. Forest Service |
| | $ 10,000 | U.S. Geological Survey |
| **Total Project Cost** | $ 348,030 | |
| **Amount Recommended** | $ 0 | |

**Project Abstract** (prepared and submitted by applicant)

Historical placer mining activities in Cave Gulch have resulted in a hydrologically unstable and highly erosive stream channel. The Cave Gulch fire of 2000 made the presence of an unstable channel significantly worse by increasing the runoff generated from precipitation events in the watershed. This was readily apparent on Memorial Day weekend, 2001, when a relatively small storm, with a recurrence interval estimated to be between two and five years, generated a flood and mudflow that inundated the community of Cave Gulch.

The primary goal of the Cave Gulch Watershed Restoration Project is to rebuild a hydrologically functioning stream that will provide a viable aquatic and riparian environment for plant and animal species, and that will withstand and pass anticipated high water events without endangering the life or property of residents in the community of Cave Gulch. The objectives will be, first, to restore the stream channel and floodplain through that portion of the stream that has been disturbed by past placer mining activities; second, to provide for temporary flood flow retention off of the active channel; and, third, to provide for passage of the creek through the community of Cave Gulch.

Lewis and Clark County has requested that the Montana Department of Environmental Quality (DEQ) be responsible for implementing the project. DEQ would be responsible for all grant administration and management, as well as technical project management.

Cave Gulch is located approximately 20 miles east of Helena in the Big Belt Mountain Range immediately adjacent to Canyon Ferry Reservoir. The project would take place within Section 2, Township 10 North, Range 1 West, and Section 35, Township 11 North, Range 1 West, Lewis and Clark County, Montana.

The project is expected to start with environmental analysis and preliminary engineering design by July 2003. Final construction is scheduled for the summer of 2004.

**Technical Assessment**

This project is probably over designed for the extent of the problem. Pumping large amounts of money into the type of reclamation proposed here (storage ponds; 5,000 feet of channel reconstruction; and four drop structures) does not appear cost-effective. A better use of funds to begin mitigation of the flood problem, at far less expense, would be to concentrate on vegetative recovery in the burned areas. Until flows are reduced (which is estimated to take five or six years through revegetation efforts), the risk of flash flooding will still exist. There is no documentation in the application of severe flooding problems in the community of Cave Gulch occurring as the result of historical mining prior to the fires of 2000. The proposed project is not scheduled for construction until July 2004, and thus, the applicant needs to take advantage of revegetation efforts now being conducted in the burned areas and design any future correction efforts on revegetative success or failure. While this approach differs from the one proposed, it would be far less expensive and likely would be more effective over the long-term. A feasibility study is urgently needed for this project. As the project currently stands, and based on the information given, RDGP cannot conduct a meaningful analysis of either costs or a preferred, cost-effective alternative to help remedy the flooding problem.

**Financial Assessment**

The total overall budget for this project consists of the following:

| | RDGP | Matching Funds | Total |
|---|---|---|---|
| Salaries and Wages | $ 3,950 | $ 24,390 | $ 28,340 |
| Employee Benefits | $ 1,050 | $ 6,580 | $ 7,630 |
| Contracted Services | $ 290,000 | $ 10,000 | $ 300,000 |
| Supplies and Material | $ 0 | $ 100 | $ 100 |
| Communications | $ 0 | $ 1,000 | $ 1,000 |
| Travel | $ 0 | $ 960 | $ 960 |
| Equipment | $ 5,000 | $ 5,000 | $ 10,000 |
| **Total** | **$ 300,000** | **$ 48,030** | **$ 348,030** |

Lewis and Clark County is seeking $300,000 from RDGP, most of which would pay for contracted services associated with this project. DEQ would contribute $13,030 in in-kind services and project administration. USFS would provide $25,000, of which $15,000 would be in-kind National Environmental Policy Act/Montana Environmental Policy Act (NEPA/MEPA) permitting services and $10,000 would be construction monies. The

U.S. Geological Survey (USGS) would provide $10,000 matching funds in the form of stream gauging equipment and in-kind flow monitoring services.

Because the stream channel and storage ponds have not been designed, a meaningful assessment of cost cannot be done. As stated earlier, RDGP feels that revegetation efforts targeting the upper burned areas would likely mitigate the flash flooding, at far less cost. Also, the vast majority of the reclamation proposed lies on USFS and U.S. Bureau of Land Management (BLM) lands, and the applicant needs to identify clearly these agencies' rehabilitative efforts and exact costs. Discussion between involved agencies, private landowners, and the applicant is currently under way in an effort to reach a consensus on final design. The funding request is probably ill-timed until rehabilitative efforts are better defined.

**Environmental Evaluation**

Impacts will vary considerably depending on the corrective action selected to address the problem. USFS, BLM, and DEQ would prepare an environmental assessment addressing the long- and short-term impacts to the environment as the result of the project. Mitigation strategies would address both short- and long-term impacts to the environment.

**Public Benefits Assessment**

The project undoubtedly would benefit the recreational users and business owners near Kim's Marina and O'Malley's at the north end of Canyon Ferry Reservoir. The community of Cave Gulch would also directly benefit if floodwaters are reduced or contained.

**Recommendation**

This project is not recommended for funding.

| | | |
|---|---|---|
| **Applicant Name** | Montana Department of Environmental Quality | |
| **Project Name** | Broadway / Victoria Mine Reclamation | |
| **Amount Requested** | $ 300,000 | |
| **Other Funding Sources** | $ 1,000,000 | U.S. Office of Surface Mining |
| **Total Project Cost** | $ 1,300,000 | |
| **Amount Recommended** | $ 0 | |

**Project Abstract** (prepared and submitted by applicant)

The Broadway/Victoria Mine is a gold, silver, lead, and copper mine that was discovered in about 1870. In 1881, it was sold to the Broadway Gold Mining Company, Ltd., and went into full production. In 1900, a 20-stamp mill was added on Cherry Creek, and a cyanidation plant was constructed below Silver Star. The mine reported production in nearly every year between 1905 and 1940 with a total return of $1,050,000 on all ore. The mine has not had much production since the 1940s.

The mine created approximately 10 acres of disturbance, including 170,000 cubic yards of tailings and waste rock that are contaminated with cyanide, arsenic, cobalt, iron, manganese, antimony, cadmium, copper, mercury, lead and zinc. There are also four open adits and an open shaft that present a safety hazard. The site is ranked 35th on the abandoned mine priority list for Montana.

The goal of the project is to reduce the threats to human health and the environment that are present at the mine. In order to accomplish the goal, DEQ would most likely isolate the contaminated wastes from the public and the natural elements by placing them in an on-site repository. The DEQ Mine Waste Cleanup Bureau would be the lead agency in the cleanup of the site.

The Broadway/Victoria Mine site is located in Section 2, Township 2 South, Range 6 West. The site is accessed from Helena by traveling 68 miles south to Whitehall, turning southwest on Highway 41, traveling 16 miles southwest of Whitehall, and turning on a BLM road 1 mile west of Silver Star in Madison County.

DEQ is documenting and studying the site, completing the remedial design, and planning to issue the construction contract for the project in 2004 to the lowest qualified bidder. The construction of the project should be completed within 60 consecutive working days of commencement.

**Technical Assessment**

DEQ would generally follow procedures under the federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); the National Contingency Plan (NCP); and Montana's Comprehensive Environmental Cleanup and Responsibility Act (CECRA) to implement cleanup actions at this site. The first step is to complete a Preliminary Assessment (PA) that entails mapping, sampling, scoring, and ranking of the site in terms of threats posed to human health and the environment. The state's PA has been completed, and the site has been identified by DEQ as the state's 35th worst abandoned hard rock mine in need of cleanup. Four open adits and one shaft present safety hazards to site visitors and wildlife. Approximately 135,000 cubic yards of tailings and 35,000 cubic yards of waste rock are contaminated with cyanide, arsenic, lead, zinc, iron, manganese, antimony, cadmium, copper, mercury, and cobalt.

The next steps in cleanup implementation are preparation of an Ownership Report, Community Relations Plan, Reclamation Work Plan, Site Survey, Laboratory Analytical Plan, Field Sampling Plan, Quality Assurance Plan, Health and Safety Plan, and Detailed Site Characterization. Ultimately, an Expanded Engineering Evaluation/Cost Analysis (EEE/CA), which identifies the preferred and most cost-effective method of cleanup, would be completed, and the project would be designed and bid, with a projected starting date of July 2004.

While the EEE/CA has not been completed (it is expected in fall 2002), it is likely that the construction would be like most of the abandoned hard rock mine cleanups that DEQ's Mine Waste Cleanup Bureau (MWCB)has conducted in the recent past. The wastes would be contained in a repository and capped, and the site would be seeded and revegetated. Variations in this strategy would be a function of the types and levels of contamination found during the proposed Detailed Site Characterization. The depth to groundwater is over 100 feet. There are no discharging adits or springs. Safety presents some concern, given the four open adits and one shaft.

The Broadway/Victoria Mine ranks 35$^{th}$ on Montana's listing of abandoned mines in need of cleanup. The severity of contamination at this site is not as great as seen at the Washington, Bluebird or Goldsil/Argo/Drumlummon sites that were also submitted by MWCB for cleanup funding during this grant cycle.

**Financial Assessment**

The total overall budget for this project consists of the following:

| | RDGP | Matching Funds | Total |
|---|---|---|---|
| Contracted Services | $300,000 | $1,000,000 | $1,300,000 |
| **Total** | **$300,000** | **$1,000,000** | **$1,300,000** |

The total budget is a preliminary estimate based on prior experience with similar projects, quantities, and unit costs and the expected difficulties. All RDGP funds would be for construction. A more accurate description of costs would be presented in the EEE/CA document and after a preferred reclamation alternative has been selected (scheduled for fall 2002). The budget as proposed targets RDGP funds as contributing 23% of the total cost, with a 77% federal match.

**Environmental Evaluation**

It is anticipated that construction related to the implementation of this project would be completed in a single field season. Therefore, impacts associated with construction activities would be considered short-term and should not significantly impact human health or the environment. Compliance with a site-specific health and safety plan, employing appropriate personal protective equipment, and following proper operating procedures would protect on-site workers. However, short-term air quality impacts to the immediate environment might occur due to the relatively large volume of waste excavation and hauling. Control of fugitive dust may thus require the use of water sprays. The predictable short-term impacts to the surrounding community would involve increased vehicle traffic with associated safety hazards, emissions, and dust generation.

DEQ would prepare an environmental assessment for the site that identifies probable impacts to the environment and mitigation measures. Necessary permits would be obtained, and DEQ would address needed measures for protecting the environment.

**Public Benefits Assessment**

Reclamation of this site would have a long-term beneficial impact on human health, safety, and the environment. It would reduce or eliminate the possibility of human contact with contaminated soils, tailings, and waste rock and secure hazardous mine openings. Short-term economic benefits would be realized by the contractor, suppliers, and area businesses.

**Recommendation**

This project is not recommended for funding.

| | | |
|---|---|---|
| **Applicant Name** | Montana Department of Environmental Quality | |
| **Project Name** | Browns Gulch Creek Restoration | |
| **Amount Requested** | $ 300,000 | |
| **Other Funding Sources** | $ 30,600 | Applicant |
| **Total Project Cost** | $ 330,600 | |
| **Amount Recommended** | $ 0 | |

**Project Abstract** (prepared and submitted by applicant)

Browns Gulch contains a small, perennial, northward-flowing stream and has been placer mined using various devices for over 100 years. The most recent miners abandoned the site and fled the state in 1988, leaving Montana with little or no chance of recovering further monies for reclamation.

Spoil materials from the open pit were dumped into the gulch after excavation, filling the gulch downstream of the pit and obliterating the stream channel. Water that collects in the bottom of the pit is conveyed beneath the spoil materials via culverts and seeps. At the upstream end of the pit, Browns Gulch Creek drops from the existing valley floor elevation to the bottom of the pit through a culvert pipe/drop structure. The pipe/drop structure often becomes blocked with debris, and the high wall of the pit also contains many seeps.

The principal goals of this project are two-fold: (1) to reestablish a stream channel through the abandoned pit and spoil materials area, and (2) to reduce the risks associated with the pipe/drop structure and culverts. As a result, aquatic habitat and aesthetics in Browns Gulch Creek would also be improved.

These goals would be achieved via the following objectives. DEQ proposes to excavate a gulch through the spoil materials in Browns Gulch and haul the material upstream to reinforce the sides of the open pit. Subsequent to removal of the spoil materials, the Browns Gulch Creek channel and floodplain would be restored.

The DEQ Environmental Management Bureau, in cooperation with the Natural Resource Conservation Service (NRCS) and Ruby Valley Conservation District, would be responsible for implementing the reclamation program at Browns Gulch.

Browns Gulch is located near Virginia City, Montana. The proposed project area is located in Sections 21 and 28, Township 6 South, Range 3 West, Madison County, Montana. The Browns Gulch Creek restoration is projected to be complete by the end of 2003. Approximately six months would be required to finalize the project design, with construction commencing about May 2003.

**Technical Assessment**

The primary goal of the Browns Gulch Creek restoration project is to reestablish a stable channel and floodplain for Browns Gulch Creek. Toward this end, the objective of this project is to remove the pipe/drop structure and replace it with a rock cascade, excavate spoil materials from the Browns Gulch stream channel, use the spoil materials to reinforce the steep slopes of the mine pit, and restore the natural channel function.

More specifically, an estimated 50,000 cubic yards of spoils would be excavated to rough out the channel and floodplain template; this material would subsequently be placed at a 2:1 slope along the sides of the pit. Approximately 3,000 cubic yards of material would be excavated and redistributed to construct the 10:1 slope for the rock cascade into the pit. Approximately 2,000 cubic yards of large rock (2 feet to 3 feet in diameter) material would be placed for the rock cascade as well as several rock drop structures in the channel at the downstream end of the disturbance.

Because of the erodibility of the soils and the frequent flooding of riparian areas adjacent to the stream channel, the reestablishment of trees and shrubs would be essential to stabilization of the site. The root systems of riparian vegetation provide for bank cohesiveness, while the plants themselves act as roughness to dissipate energy during overbank flows.

Willows along the existing creek should be salvaged prior to construction operations and replanted in an appropriate temporary location. Willows should be returned to the creek during the revegetation stage of the project. In the riparian area, 200 willows cuttings from adjacent areas would be planted per acre. Trees should be planted in the spring before sprouting or fall after dormancy.

If DEQ hires qualified contractors to design and construct the project, this restoration should alleviate problems due in part to past placer mining activity. This project does not pose a threat to water quality or aquatic life as the result of high metal concentration. If stream channel integrity and habitat are restored, however, fishery opportunities for western cutthroat trout may be enhanced.

While the project has merit, the application fails to address the party responsible for the proposed reclamation. It appears that the mineral owner bears the burden of restoring the site to pre-mining conditions in that he allowed development (mining) to take place. The federal government (NRCS) possibly shares some of this responsibility in that it installed the failed culvert and drop structure. Portions of the site proposed for reclamation are also actively permitted by DEQ. The applicant also needs to investigate any obligation that may have been incurred by the surface owner (Cal Creek Ranch). These critical issues were not addressed in the application. Another outstanding concern is possible access restrictions to this property by the landowner, in which case the prospective public benefits would be severely diminished. Until these concerns are resolved, RDGP cannot determine whether the project is eligible for grant funds. Regardless, the project is a low priority for RDGP funds.

**Financial Assessment**

The total overall budget for this project consists of the following:

| | RDGP | Matching Funds | Total |
|---|---|---|---|
| Salaries and Wages | $ 0 | $ 18,400 | $ 18,400 |
| Contracted Services | $ 250,000 | $ 0 | $ 250,000 |
| Employee Benefits | $ 0 | $ 4,968 | $ 4,968 |
| Supplies and Materials | $ 50,000 | $ 0 | $ 50,000 |
| Communications | $ 0 | $ 1,000 | $ 1,000 |
| Travel | $ 0 | $ 900 | $ 900 |
| Indirect Costs | $ 0 | $ 5,332 | $ 5,332 |
| **Total** | **$ 300,000** | **$ 30,600** | **$ 330,600** |

For the quantities of material listed, the costs of construction appear reasonable. Costs for the large rock component cannot be verified by the information given.

**Environmental Evaluation**

The overall impact to the environment is expected to be both beneficial and long-term. Short-term adverse impacts to water quality are expected during construction. A 310 permit and 3A authorization are likely to be required for temporary water quality exceedances. An environment assessment would have to be prepared that identifies appropriate measures to avoid or mitigate problems associated with construction activities. Heritage resource clearance would be completed with the State Historic Preservation Office before construction start-up. Erosion protection measures would have to be undertaken after construction in order to allow vegetation to become reestablished. Stabilization of this drainage should result in beneficial, long-term impacts, including improved water quality, particularly during precipitation events.

**Public Benefits Assessment**

The project would result in increased watershed stability, improved water quality, and enhanced fish habitat. This project should incrementally help to improve water quality in Browns Gulch Creek by reducing sedimentation from stream areas disturbed by placer mining. Backfilling a steep-sided pit would remove potential hazards to site users. This project would enhance recreation opportunities, in that nearby Virginia City and Nevada City are utilized by numerous Montana residents and out-of-state visitors for a variety of activities, including fishing, camping, driving for pleasure, hunting, and wildlife viewing.

**Recommendation**

This project is not recommended for funding.

| | | |
|---|---|---|
| **Applicant Name** | Montana Department of Environmental Quality | |
| **Project Name** | Former Equity Co-Op Bulk Plant | |
| **Amount Requested** | $ 300,000 | |
| **Other Funding Sources** | $ 40,000 | Applicant |
| **Total Project Cost** | $ 340,000 | |
| **Amount Recommended** | $ 0 | |

**Project Abstract** (prepared and submitted by applicant)

The former Equity Co-Op Bulk Plant is an abandoned fueling facility that operated from 1969 to 1999. It is located adjacent to Highway 2 just outside of the Harlem city limits between residential and agricultural properties in Blaine County. The legal description for the site is as follows: Northeast Quarter of the Southwest Quarter of Section 18, Township 32 North, Range 23 East, Principal Montana Meridian.

In March 1997, a release of gasoline and diesel fuel was discovered. Equity Co-Op's investigation revealed significant soil and groundwater contamination and off-site migration of the petroleum-hydrocarbon plume. Equity Co-Op discontinued investigation and cleanup in 1999 due to financial insolvency. This contamination threatens public health through potential migration to residential properties and utility corridors, and it hinders redevelopment of the property. The petroleum release is not eligible for monies from either the Montana Petroleum Tank Release Cleanup Fund or the federal Leaking Underground Storage Tank Trust Fund.

The project goal is to clean up the site by reducing the mass of petroleum contamination by removing approximately 12,000 cubic yards of contaminated soil and treating it at a nearby one-time land farm or licensed facility. Continued groundwater monitoring would be necessary to document the natural degradation of residual dissolved-phase petroleum hydrocarbons and to ensure that petroleum-contaminated groundwater is not impacting any potential receptors.

DEQ's Remediation Division would be the lead agency for this project. All work would be coordinated with the City of Harlem and Blaine County. The soil-removal phase of the project is scheduled for September 2003 and should be completed within one month. The groundwater-monitoring phase of the project would continue for up to 10 years.

**Technical Assessment**

The former Equity Co-Op Bulk Plant site consisted of three 10,000-gallon and three 15,000-gallon aboveground storage tanks (ASTs), a bulk loading rack, and underground piping and dispensers.

The Montana Department of Environmental Quality (DEQ) was notified of a petroleum release in March 1997, when diesel fuel was reported to be seeping out of the ground near underground product piping and dispensers. In response, the underground product lines were exposed and removed. Upon removal, numerous holes were discovered in both the diesel and gasoline product lines. A test pit investigation completed after their removal revealed that significant soil and groundwater contamination was present on-site. Free-phase gasoline and diesel were also detected in numerous test pits. Two recovery wells were installed, and Equity Co-Op personnel recovered approximately 300 gallons of mixed gasoline and diesel fuel.

In 1998, Equity Co-Op's environmental consultants completed two investigations to further define the extent and magnitude of the petroleum contamination. In May 1998, Atlatl, Inc. completed a geoprobe investigation consisting of 20 soil borings and 4 piezometers. In October 1998, Delta Engineering, Inc. installed eight 2-inch-diameter groundwater-monitoring wells. The investigations confirmed that soil and groundwater were contaminated with petroleum over a widespread area and that the petroleum hydrocarbon plume was moving off-site.

Equity Co-Op discontinued investigation and cleanup in 1999 due to financial insolvency. The petroleum release is not eligible for either the Montana Petroleum Tank Release Cleanup Fund or the federal Leaking Underground Storage Tank Trust Fund. Due to the lack of funding, Environmental Contingency Account (ECA) funds were obligated to DEQ by the Racicot administration to cover additional investigation and water main replacement costs.

In 2000 and 2001, HKM Engineering, Inc., under contract to DEQ, completed additional investigation and monitoring. In May 2000, six additional soil borings were evaluated, and groundwater monitoring was completed to assess the extent of soil contamination and to verify groundwater conditions. HKM estimated that approximately 12,000 cubic yards of petroleum-contaminated soil exist on-site and that underground utilities were potentially in contact with petroleum-contaminated soil and groundwater. In June 2001, two water mains were

investigated using a vacuum truck. One of the two water mains, a private 3-inch PVC water main, was found to be in contact with petroleum-contaminated soil and groundwater. Since it has been documented that PVC water mains can be permeated by petroleum contaminants, the 3-inch PVC water main is scheduled for replacement in 2002. ECA funding is available only for the water line replacement phase of the project. Additional funding is needed to clean up the petroleum release and further evaluate the extent of groundwater contamination.

The goal of the project is to clean up the petroleum-contaminated soil and groundwater to DEQ risk-based screening levels (RBSLs) and Montana WQB-7 water quality standards. Two primary objectives to achieve the goal are outlined below.

1. The first objective to achieve the goal includes removing approximately 12,000 cubic yards of petroleum-contaminated soil and hauling it to a nearby one-time landfarm or licensed disposal facility. The removal of the soil would greatly reduce the mass of petroleum contamination on-site and would limit leaching of petroleum contaminants to groundwater. This would also help to limit off-site migration and assist in natural attenuation of the dissolved-phase petroleum hydrocarbon plume, thus reducing off-site impacts to private property and underground utilities. This objective would be easily measured through the collection of soil confirmation samples and would be met once the soil removal project is completed. A 10% contingency has been added to the proposed project budget to allow for additional excavation of contaminated soil and collection of confirmation samples, if necessary.

2. The second objective necessary to achieve the goal is monitoring the groundwater. Ten groundwater-monitoring wells would be needed to replace wells damaged or destroyed during the soil removal phase of the project and to ensure that the plume is well defined. Groundwater monitoring would be essential to evaluate the impact of the soil removal phase of the project on groundwater quality and to ensure that petroleum-contaminated groundwater is not impacting or threatening any potential receptors. This phase of the project would continue for up to three years to document the natural degradation of residual dissolved-phase petroleum constituents. Wells would be sampled quarterly for one year and then semi-annually for an additional two years. A 10% contingency has been added to the proposed project budget to allow for the installation of additional wells and to complete additional sampling, if necessary.

**Financial Assessment**

The total overall budget for this project consists of the following:

| | RDGP | Matching Funds | Total |
|---|---|---|---|
| Contracted Services | $300,000 | $40,000 | $340,000 |
| **Total** | **$300,000** | **$40,000** | **$340,000** |

The total RDGP funding that is being requested is $300,000 with most of the funding ($203,750) being requested for construction activities. Because DEQ intends to contract out the project, the entire project budget was listed under contracted services. The grant application provides a detailed breakdown of the anticipated costs in the text portion of the budget justification narrative. Contracted services would include; consulting, laboratory analysis, soils excavation and disposal, installation of backfill material, and monitoring well installation and sampling. Consulting fees would include the preparation of a summary report and supervision of all construction activities. Confirmation sampling is included in the analytical budget to confirm that remediation goals are met.

Unit costs for consulting fees, laboratory analysis, soils disposal, backfill material and monitoring well installation appear to be reasonable and adequate for a job of this nature. A 10% contingency is included in the project budget to allow for additional soil excavation, confirmation sampling, monitoring well installation, and groundwater sampling.

The applicant contribution is DEQ funding to be invested in the replacement of a water main located within the contaminated soil downgradient of the former Equity Co-Op Bulk Plant. The estimated cost of the water line

replacement is $40,000. Funds for the water line replacement are being obtained from a 1999 Governor's Emergency Contingency Account Grant.

**Environmental Evaluation**

No long-term adverse environmental impacts are anticipated in conjunction with the proposed remediation activities. Short-term impacts might include increased truck traffic, dust, and potentially some petroleum odors during construction activities, but those impacts are anticipated to be minor. During construction activities, care would have to be taken to avoid the accidental loss of contaminated soils or runoff into the surrounding area. Off-site migration of contaminated soil could easily be prevented by using standard silt fencing practices.

**Public Benefits Assessment**

In addition to the protection of human health, removal of soil contamination would greatly benefit the quality of soil, groundwater, and, potentially, surface water. Additional benefits of the site remediation would include getting the property back on the tax books and the potential for economic development of the area. Positive (yet lesser) impacts might also be provided to area wildlife and vegetation resources.

Completion of the project would ensure that petroleum would be removed from the soil and would prevent migration of contaminants to groundwater and potentially to surface water. These actions would provide long-term benefits for all of the above-mentioned resources and would provide benefits to local residents and all Montanans who use the area impacted by the contamination.

**Recommendation**

No funding is recommended for this project.

| | | |
|---|---|---|
| **Applicant Name** | Montana Department of Environmental Quality | |
| **Project Name** | Kendall / Hilger Area - Barnes / King Gulch Tailings Removal | |
| **Amount Requested** | $ 300,000 | |
| **Other Funding Sources** | $ 62,713 | Applicant |
| **Total Project Cost** | $ 362,713 | |
| **Amount Recommended** | $ 0 | |

**Project Abstract** (prepared and submitted by applicant)

Underground mining for gold occurred sporadically within the Kendall Mining District between 1900 and 1942. Ore recovered was milled in upper Barnes-King Gulch and processed by vat leaching. During this period of milling operations, approximately 800,000 cubic yards of tailings were discharged into Barnes-King Gulch and have over time migrated downstream over 2 miles to its confluence with North Fork Last Chance Creek. Water quality monitoring conducted above and below the tailings deposit in Barnes-King Gulch indicates that water flowing through these wastes continues to leach thallium and arsenic. The tailings are highly erosive in their present location and continue to wash farther downstream into Last Chance Creek during storm events.

C.R. Kendall Corporation (CRK) operated an open pit mining operation upstream of the Barnes-King Gulch tailings site between 1987 and 1995. CRK did not stockpile quantities of topsoil or other reclamation materials adequate to cover its mine waste facilities to the depths specified in currently approved reclamation plans. The Barnes-King Gulch tailings may prove suitable for a subsoil substitute on the mine site. Alternatively, the tailings could be used as additional backfill for reclaiming the Kendall mine pits.

DEQ is seeking $300,000 from RDGP for tailings removal and stream rehabilitation. With this funding, DEQ intends to complete the tailings removal and stream restoration.

The principal goals of this project are three-fold. First, this project could result in a thicker reclamation cover at the Kendall Mine by utilizing Barnes-King Gulch tailings as additional subsoil, which would improve long-term revegetation success and increase associated evapotranspiration. This would reduce the quantity of water infiltrating the reclamation cover, thus reducing the amount of water requiring collection and treatment. A second goal is to reduce water pollution resulting from interaction of surface water with the tailings in lower Barnes-King Gulch as well as North Fork Last Chance Creek. The third goal is to improve aesthetics in the Barnes-King Gulch area.

These goals would be achieved via the following objectives. DEQ proposes to excavate tailings from Barnes-King Gulch and haul the material to the Kendall Mine, where it will either be applied to the surfaces of heap leach pads and waste rock dumps prior to placement of the topsoil cover, and/or be placed as pit backfill. Subsequent to removal of the tailings, the Barnes-King Gulch channel would be restored.

DEQ's Environmental Management Bureau would be responsible for implementing this tailings removal project and possibly also for the reclamation of the Kendall Mine site.

The Barnes-King Mine tailings are located in Sections 32 and 33, Township 18 North, Range 18 East, within Barnes-King Gulch in Fergus County, Montana. They are located 1 to 2 miles east of the old town of Kendall, approximately 6.25 miles northwest of Hilger and about 16 miles north of Lewistown on U.S. Highway 191. The area is shown on the Kendall, Montana 7.5-minute U.S. Geological Survey quadrangle.

Barnes-King Gulch tailings removal and placement on the Kendall Mine site are projected to be completed by early 2004. Tailings excavation and hauling to the Kendall Mine site are anticipated to begin in July or August 2003. Tailings removal would take approximately three to four months and be completed before the end of 2003. Final regrading would be completed, and revegetation of the restored drainage is anticipated during the spring of 2004.

**Technical Assessment**

The application does not contain sufficient information on which to make a defensible funding recommendation. The discussion on reclamation alternatives is generally lacking detail, does not clearly tie the proposed project with reclamation being conducted (or planned) at the Kendall Mine, and contains unsupported statements regarding contamination levels, erosion and infiltration rates, water volumes, effectiveness of amended soils, and vegetation density. Cost comparisons of several feasible reclamation alternatives were omitted or overlooked, making it impossible to rate the cost-effectiveness of the proposed reclamation. It generally appears that little effort went into preparation of this proposal, which is confusing considering that a private consultant has evidently been hired to design and coordinate the project with Kendall Mine reclamation efforts. The applicant is planning to complete an environmental impact statement in the summer of 2003 that will more accurately define the reclamation options available and the cost associated with each.

**Financial Assessment**

The total overall budget for this project consists of the following:

| | RDGP | Matching Funds | Total |
|---|---|---|---|
| Salaries and Wages | $ 0 | $ 16,250 | $ 16,250 |
| Employee Benefits | $ 0 | $ 4,388 | $ 4,388 |
| Contracted Services | $ 300,000 | $ 20,000 | $ 320,000 |
| Supplies and Materials | $ 0 | $ 244 | $ 244 |
| Communications | $ 0 | $ 1,280 | $ 1,280 |
| Travel | $ 0 | $ 5,804 | $ 5,804 |
| Miscellaneous | $ 0 | $ 14,747 | $ 14,747 |
| **Total** | **$ 300,000** | **$ 62,713** | **$ 362,713** |

Quantity and unit costs cannot be verified by the information given. Specifics of the bond matching funds and future funding needs are not given, making it impossible to assess the need for RDGP funds to remove and haul the subject tailings to the Kendall Mine site.

**Environmental Evaluation**

Short-term adverse impacts associated with traffic and equipment operation could be expected due to construction activities. There could be other short-term impacts, but, based on the information submitted, they cannot be assessed. No long-term adverse impacts are anticipated. Impacts to the environment, both short- and long-term, should be adequately addressed in the required EIS scheduled for the summer of 2003.

**Public Benefits Assessment**

Insufficient details are given to assess the public benefit of the project. Private benefits would presumably accrue to at least one individual who owns the land on which the tailings are located.

**Recommendation**

This project is not recommended for funding.

| | |
|---|---|
| **Applicant Name** | Montana Department of Environmental Quality |
| **Project Name** | MTS Tire Recyclers Cleanup |
| **Amount Requested** | $ 300,000 |
| **Other Funding Sources** | $ 3,124 Applicant |
| **Total Project Cost** | $ 303,124 |
| **Amount Recommended** | $ 0 |

**Project Abstract** (prepared and submitted by applicant)

The MTS Tire Recyclers' abandoned tire facility is a 4-acre gravel pit located on a 20-acre parcel of state-owned land, leased to a private party. The specific location of the site is in the Southwest Quarter of the Southeast Quarter of Section 25, Township 2 South, Range 20 East, Principal Montana Meridian, Stillwater County, Montana. Generally, the site is located approximately 7 miles east of Columbus and south of Highway 10. The site is a dissected bench above the Yellowstone River. It is sparsely vegetated, and, prior to being licensed as a solid waste management facility, it was used for rangeland and gravel extraction.

The proposed project addresses the need to clean up and remove approximately 300,000 waste tires from their present location on state-owned land. The tires were abandoned by the owner/operator of MTS Tire Recyclers in 1996, and he has since declared bankruptcy and left the state.

The tires pose a great fire hazard. Tire fires are difficult and costly to fight and in some instances can persist for weeks before being extinguished. The cleanup after a tire fire could last for years, and the site could potentially become a Superfund site. The tires could be ignited by lightning, arson, or a grass fire. If the tires are ignited, the runoff from the tires could enter the Yellowstone River below via one of the several channels that originate on the site. The toxic smoke would affect downwind communities such as Laurel and Billings. Presently, the tires are an ideal habitat for disease vectors such as skunks, mice, and mosquitoes.

DEQ's Solid Waste Program would be the party responsible for the cleanup of the site. The goals of the project are to remove the tires from the site and properly dispose of them at a licensed solid waste management facility. A third party would be contracted to do this work. The tires would subsequently be reused, buried, or incinerated for energy. The cleanup is anticipated to last three months. The site would then be returned to the pre-licensed state.

**Technical Assessment**

The application is deficient in a number of areas, making it difficult to evaluate. RDGP identified these concerns, among others:

- Numerous words and sentences are missing from the application. It is very difficult to sense what the applicant is or isn't saying.
- There is no evidence that alternatives other than the one selected were ever examined.
- There is insufficient information on the preferred alternative, i.e., removing the tires to a licensed facility. Lacking, for example, are the location, haul distances, number of tires, number of loads, comparative bid analysis, cost, whether all or just a portion of the pit will be removed and the status of any attempts made by DEQ to hold the operator responsible.
- The effort that DNRC's Trust Land Management Division conducted in 2000 is not mentioned.
- There is no explanation of why DEQ licensed the facility, if, as indicated in the application, the operator had insufficient funds to operate it.
- There is no discussion of the implementation or success of the after-the-fact remedial measures at similar sites, e.g. Pablo Tire in 2001.
- There is no mention of any permits that may be required, landowner consent, or public notices.
- There is no map or photo of the site, as required.
- There is no cost benefit analysis that adequately discusses costs, direct and indirect, and benefits.
- Clarification is needed as to why an inaccurate survey led to placement of tires on state-owned property.
- No details are presented supporting the statement in the proposal to the effect that hauling tires by large trucks is the most efficient and cost-effective removal method.
- More information is needed on potential impacts to the Yellowstone River, including sediment loads.
- Because details presented in the application are sketchy, there is no way to assess the feasibility of the timetable projecting that the project will be completed by September 2003.
- Although vector control is mentioned throughout the proposal, no information regarding abatement or cost is presented.
- There is no monitoring plan to rate the effectiveness of the cleanup.
- The environmental checklist raises a lot of questions on whether it is representative of the project.
- Section 10 of the application (on the liable party or parties) is vague and incomplete.
- Documentation of crucial state need is not provided as required.

In spite of these shortcomings, RDGP has some information on site conditions as the result of DNRC's grant application for this same project in May 2000. Since the site presents serious concerns regarding potential fire hazards and any potential liability for the costs of any fire suppression efforts may default to the state, the grant request should be considered for RDGP funds, if grant money is available.

**Financial Assessment**

The total overall budget for this project consists of the following:

| | RDGP | Matching Funds | Total |
|---|---|---|---|
| Salaries and Wages | $ 0 | $ 2,000 | $ 2,000 |
| Employee Benefits | $ 0 | $ 540 | $ 540 |
| Contracted Services | $ 300,000 | $ 0 | $ 300,000 |
| Travel | $ 0 | $ 400 | $ 400 |
| Miscellaneous | $ 0 | $ 184 | $ 184 |
| **Total** | **$ 300,000** | **$ 3,124** | **$ 303,124** |

Budget detail is non-existent. Hiring a contractor for $300,000 is the whole proposal, with DEQ providing $3,124 DEQ in staff time and travel. As mentioned in the Technical Assessment, RDGP has additional cost information

from the year 2000 request that could be used to help justify this proposal. The estimate of the total project cost was $230,000 in the earlier application, which substantiated the costs better than the current request.

**Environmental Evaluation**

Without knowing details of the removal, it is difficult to evaluate short- or long-term impacts created by the project. It is assumed that increased traffic and heavy equipment would have a short-term impact on area soils, vegetation, and air quality.

**Public Benefits Assessment**

The applicant lists elimination of a source of fuel material and subsequent fire hazards as the result of removing the tire pile. The pile also is a source of disease vectors such as mosquitoes, skunks, and rats. Another matter not mentioned would be the potential to lease the land and thereby acquire revenues for the school trust fund.

**Recommendation**

This project is not recommended for funding.

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|---|---|
| **Applicant Name:** | Montana Department of Environmental Quality |
| **Project Name:** | Williams Clay Pit Reclamation |
| **Amount Requested** | $ 300,000 |
| **Other Funding Sources** | $ 339,355 Applicant |
| **Total Project Cost** | $ 639,355 |
| **Amount Recommended** | Application withdrawn on June 28, 2002 by applicant. |

**Project Abstract** (prepared and submitted by applicant)

The Williams Clay Pit is a 52-acre pit located in Section 29: T25N R24E, 2 miles due west of Landusky. A permit was issued to Zortman Mining, Inc., under provisions of the Open Cut Reclamation Act, to produce approximately 500,000 cubic yards of bentonitic shale for liner material at the mine. Zortman Mining, Inc. has since undergone bankruptcy, the permit has been revoked, and the reclamation bond of $295,485 has been forfeited.

Additional site investigations during development of a reclamation plan revealed previously unanticipated environmental issues, specifically (1) subsoil shales of extremely low pH that require incorporation of calcium carbonate to neutralize the native acidity and protect the soil to be placed over reclaimed substrate, and (2) excessive salinity exposed in the upper layers of a portion of the pit.

The project would provide for reclamation of the pit and haul road. Site grading would reduce cut slopes in the pit and route drainage away from a deeply eroded slope that has been headcutting. The drainage would be dispersed by spreader dikes, and ultimately the flow would enter a coulee on the west boundary of the pit area. Eroded slopes would be repaired, and a 590-foot drainage control bench would be constructed across the top of the eroding slope. Reclamation grading would entail approximately 88,000 Cubic Yards of earthwork. Acid-producing shales would be treated by incorporating 600 tons (30 tons/acre) of a calcium carbonate equivalent to a depth of 6- to 8-inches. This product would be purchased and hauled to the site. Following grading and lime incorporation, all areas would be covered by previously salvaged neutral overburden and soil, which would provide a 1-foot cover over amended shale. An organic soil amendment would be purchased and applied to all soil-covered areas. The entire site would be seeded. Erosion mats would be used on steep and erosive slopes. A fence of about 3,840 feet would be constructed to provide protection from grazing during the establishment period.

The project would also provide for reclamation of 7,450 feet of haul road between the clay pit and Landusky, reestablishing three plugged coulees and reducing the amount of sediment now reporting to a stockwater pond.

| | | |
|---|---|---|
| **Applicant Name** | Powell County | |
| **Project Name** | CMC Roundhouse Site Cleanup | |
| **Amount Requested** | $ 276,450 | |
| **Other Funding Sources** | $ 135,425 | Applicant |
| | $ 6,175 | MFG In-Kind/Previous Work |
| **Total Project Cost** | $ 418,050 | |
| **Amount Recommended** | $ 0 | |

**Project Abstract** (prepared and submitted by the applicant)

This project would enable Powell County to remove petroleum and other industrial-related contamination from the former Chicago-Milwaukee Railroad Roundhouse facility. Specific activities to be funded would include:

- Complete a detailed site assessment and characterization of the site
- Remove the concrete fuel tank
- Remove the oil separator and underground waste lines
- Remove soils contamination at the roundhouse
- Remove various areas of contaminated soils on the site
- Support Montana Department of Environmental Quality (DEQ) efforts for remediation and closure under the Comprehensive Environmental Cleanup and Responsibility Act (CECRA)

During the last 10 years, DEQ has struggled to fully assess the environmental damage at this site. The site is on the Montana State Superfund CECRA list and has been ranked as a high priority site, but DEQ has not had the necessary funding to manage the site remediation. This project would allow local government, in concert with DEQ, to implement necessary remediation activities for the benefit of the entire Butte economic region.

Support and commitment from the State of Montana would be critical to the success of this project. The project area and the surrounding lands are a prime economic and environmental resource. The immediate environmental mitigation of industrial-related contamination would ensure that this site becomes an important economic component of the Butte economic region, Powell County, and the City of Deer Lodge.

The eventual reclamation and redevelopment of this site would have an important impact on the immediate economies and the region in general. This project would provide the support and leverage needed to bring a number of other investment and funding mechanisms to bear on the local community and local natural resources. Brownfield (U.S. Environmental Protection Agency [EPA]) and Economic Development Administration (EDA) funding applications are currently under way, and this project would provide important initial support for those efforts.

The CMC Roundhouse site could be fully and effectively remediated through the funding of this program. The project site has lain bare, underutilized, and potentially polluting for the past 20 years. The dedicated effort, funded by this grant, could remove this site from the CECRA listing. Now is the time to support these local, and DEQ, efforts in cleaning the site and returning the area to a productive use of natural and economic resources.

**Technical Assessment**

The 27-acre CMC Roundhouse site is located adjacent to the city limits of Deer Lodge along the west bank of the Clark Fork River. The site is currently owned by the CMC Real Estate Corporation of Chicago, Illinois. The roundhouse was built in 1908, abandoned in 1980, and demolished in 1984. The roundhouse area contained refueling and repair facilities for the electrified rail line providing service between Harlowton, Montana, and Avery, Idaho. Steam and electric engines were serviced and refueled at the site.

Remedial investigations conducted at the site have identified elevated levels of volatile organic compounds, diesel range organics, total extractable hydrocarbons, oil, and grease. Based on the findings of these investigations, the site was placed on the Montana State Superfund CECRA list and was ranked as a high priority by DEQ.

However, DEQ has not fully assessed the environmental contamination at the site and has not had the necessary funding to manage the site remediation.

Research of potentially responsible parties has determined that the current owner, CMC Real Estate Corporation, is responsible for contamination and cleanup of the site. However, this entity is currently in arrears in reimbursing DEQ remediation efforts at the site and has shown no willingness to resume payments. In addition, DEQ has insufficient staffing to support or conduct remediation efforts at the site. Powell County has agreed to complete a prospective purchase agreement with the current property owner for full title to the property at completion of remediation activities. A letter of commitment (Board of County Commissioners, Powell County, Montana – Resolution) stating Powell County's intention to obtain title to the property was included with the RDGP grant application.

The goals of the project include elimination of risks to human health, enhancement of natural resources, completion of a CECRA site closure, and enhancement of future economic development potential for the area. In order to attain these goals, six principal objectives for the project were identified.

1. Complete a detailed site characterization and assessment
2. Remove the concrete storage tank and associated contaminated sludge and soil
3. Remove the former oil separator and associated underground piping
4. Remove contaminated soils from the site
5. Remove surface waste, debris, and hazardous junk from the site
6. Complete related site reports and CECRA closure reports

The detailed site assessment would include compilation and review of all existing site data, preparation of a recommendation for additional site investigation, site sampling activities, and completion of a detailed site assessment report. Removal of site features and contaminated soils would involve the use of readily available heavy equipment (backhoe and dump trucks) following standard excavation procedures. Contaminated soils would be transported to a commercial landfarm facility or would be landfarmed on site. "Landfarming" consists of stockpiling of soils and regular tilling to allow volatile components to vent from the contaminated material until the material is tested and determined to be appropriate for reuse or disposal. Concrete from the underground tank, piping, and scrap materials removed from the site would be transported to the local landfill.

**Financial Assessment**

The total overall budget for this project consists of the following:

| | RDGP | Matching Funds | Total |
|---|---|---|---|
| Salaries and Wages | $ 29,000 | $ 3,100 | $ 32,100 |
| Contracted Services | $ 210,050 | $ 24,600 | $ 234,650 |
| Supplies and Materials | $ 2,200 | $ 800 | $ 3,000 |
| Communications | $ 650 | $ 250 | $ 900 |
| Travel | $ 900 | $ 400 | $ 1,300 |
| Rent and Utilities | $ 1,450 | $ 350 | $ 1,800 |
| Equipment | $ 2,200 | $ 2,100 | $ 4,300 |
| Miscellaneous | $ 30,000 | $ 110,000 | $ 140,000 |
| **Total** | **$ 276,450** | **$ 141,600** | **$ 418,050** |

The total RDGP funding that is being requested is $276,450 with most of the funding ($174,700) being requested for construction activities. Salaries and wages requested include those for DEQ oversight and document review. Oversight would include review of field work plans, field activities, drafts, and final project reports. Contracted services would include consulting, laboratory analysis, soils disposal, backfill placement, and monitoring well installation. Consulting fees would include the preparation of a field work plan and the summary reports and supervision of all construction activities. Confirmation sampling is included in the analytical budget to confirm that remediation goals are met.

Unit costs for salaries and wages, consulting fees, laboratory analysis, soils disposal, backfill material, and monitoring well installation appear to be reasonable and adequate for a job of this nature. A considerable amount of funds could be saved if the excavated soils can be locally landfarmed. A savings of at least $20 per cubic yard could be realized if a suitable local landfarming location could be obtained for all or a portion of the petroleum-contaminated soil.

The applicant's contributions would include the time Powell County employees spend on grant administration; equipment operation; project planning; and review of work planning documents, site closure applications, and final reports. Powell County will also provide the backhoe and dump truck equipment for the initial soils testing and the investigations of the concrete tank and oil separator lines. Powell County has agreed to complete a prospective purchase agreement with the current property owner (CMC) for full title to the site property. The purchase price of the property (approximated at $110,000) has been included as an applicant contribution to the project. The purchase of the property would be contingent upon the funding of this grant application.

Brownfield (EPA) and EDA funding applications are currently being prepared by Powell County in conjunction with the submittal of this application.

**Environmental Evaluation**

No long-term adverse environmental impacts are anticipated in conjunction with the proposed remediation activities. Short-term impacts might include increased truck traffic, dust, and potentially some petroleum odors during construction activities, but those impacts are anticipated to be minor. During construction activities, care would have to be taken to avoid the accidental introduction of contaminated soils into the surrounding surface water bodies by using standard silt fencing practices.

**Public Benefits Assessment**

In addition to the protection of human health, removal of historical site contamination and debris and completion of site remediation would greatly benefit the quality of soil and would benefit groundwater and surface water (of the Clark Fork River and Tin Cup Joe Creek). Additional benefits of the site remediation would include the potential for economic development of the area. Positive (yet lesser) impacts would also be provided to area wildlife, vegetation, and fisheries resources.

Completion of the project would ensure that petroleum and other railroad-related contamination would be removed from the soil and would prevent migration of contaminants to groundwater and surface water. These actions would provide long-term benefits for all of the above-mentioned resources and would provide benefits to local residents and all Montanans who use the Clark Fork River area impacted by the contamination.

**Recommendation**

No funding is recommended for this project.

| | | |
|---|---|---|
| **Applicant Name** | Powell County | |
| **Project Name** | Kimball Mine Complex Reclamation | |
| **Amount Requested** | $ 300,000 | |
| **Other Funding Sources** | $ 1,750 | Applicant |
| | $ 1,000 | Montana Department of Fish, Wildlife and Parks |
| | $ 659,450 | U.S. Forest Service |
| **Total Project Cost** | $ 962,200 | |
| **Amount Recommended** | $ 0 | |

**Project Abstract** (prepared and submitted by applicant)

The Kimball Mine Complex consists of four abandoned mines: the Kimball Mine, the Treasure Mountain Mine, the Big Dick Mine and Millsite, and the Upper Kimball Mine. All of the mine sites in the complex are located adjacent to an unnamed tributary to or along the Little Blackfoot River. Mill tailings and waste rock dumps associated with the Kimball Mine Complex are located in or immediately adjacent to the floodplain of this unnamed tributary, causing metals-laden water and sediments to be flushed into the headwaters of the Little Blackfoot River.

The goals of this project are to (1) restore the headwaters of the Little Blackfoot River by reducing the amount of metals-laden water and sediment polluting surface water and groundwater sources, (2) maintain the historical integrity of the site, and (3) improve spawning and rearing habitat for bull trout and west slope cutthroat trout in the Little Blackfoot River.

Powell County has requested that the Helena National Forest be responsible for carrying out this project. Powell County and the Helena National Forest entered into a similar agreement when Powell County received a RDGP grant for reclamation of the Charter Oak Mine and Millsite in 1996 and 1998, and also when Powell County received a RDGP grant for reclamation of the Ontario Mine in 2001. Besides the work at the Charter Oak and the Ontario Mine sites, the Helena National Forest has been involved in reclamation of four additional mine sites in the past seven years. It has the technical capabilities to oversee this project from design to implementation.

The project is located approximately 10 miles south of Elliston, Montana, in the Little Blackfoot River drainage on U.S. Forest Service land in Powell County. The entire project is estimated to take place over a two-year period, from November 2002 to October 2004, with reclamation construction taking place from June to October 2004.

**Technical Assessment**

The application fails to point out that privately held lands within the project's area would not be addressed by the proposed action. In this regard, the proposal is similar to the Ontario Mine that RDGP funded in 2001. RDGP's position on the Ontario, and again on this proposal, is that federal/state partnerships on abandoned mine cleanups must include both private and federal lands where applicable. In cases where contamination from adjacent private lands impacts the proposed cleanup on federal land, or visa versa, then those private lands must be included as part of the cleanup. The U.S. Forest Service (USFS) has the policy of not reclaiming any privately held lands, regardless of the source of the mining waste. The Armstrong Mine within the Tenmile Creek Watershed is an example of a Forest Service cleanup in which mining waste situated on the Helena National Forest eroded down gradient and onto privately held property. The Helena National Forest reclaimed all portions of the Armstrong Mine site that were within the Helena National Forest boundary; however, the mine waste that had washed down onto the privately held property remains there today. If privately held lands are contaminated with mining wastes, they will continue to be a source of off-site contamination. The subject alternatives analysis must address reclamation of private holdings for the cleanup to be cost-effective.

The applicant has not presented any goals related to human health, nor has it presented quantifiable health risks that exist today. As presented, the project is not a high RDGP priority because any wastes on privately held property would remain; thus, a partial cleanup would result. This project would be only slightly more protective than the no action alternative because only a portion of the waste would be removed, rather than all of it. The severity of the problem is inadequately described because of the applicant's failure to address mine wastes within the patented claims. The stated goals do not address human health cleanup goals; therefore, it is impossible to determine whether significant risk reductions would result.

A lingering issue relevant to all USFS/state mine cleanups is the federal reluctance to allow any private wastes (funded by RDGP) to be disposed of in a federal repository. At the time of this review, reclamation of the Ontario Mine using RDGP funds is on hold pending the resolution of waste deposition. For a cost-effective state/federal partnership in the area of mine cleanup, both jurisdictions need to reach consensus on waste disposition. Until cost-effective actions, both technical and administrative, are taken in that regard at the Ontario Mine, it seems premature to consider RDGP funding for this project.

**Financial Assessment**

The total overall budget for this project consists of the following:

| | RDGP | Matching Funds | Total |
|---|---|---|---|
| Salaries and Wages | $ 3,250 | $ 68,500 | $ 71,750 |
| Contracted Services | $ 296,450 | $ 591,550 | $ 888,000 |
| Communications | $ 0 | $ 500 | $ 500 |
| Travel | $ 200 | $ 750 | $ 950 |
| Miscellaneous | $ 100 | $ 900 | $ 1,000 |
| **Total** | **$ 300,000** | **$ 662,200** | **$ 962,200** |

Unit costs are not detailed, but those given appear high when compared to bid tabulations on similar projects in the general area. There is also the possibility that the project would be completed without the use of RDGP funds. The project rates lower priority because RDGP funds would be used exclusively for public land managed by USFS.

**Environmental Evaluation**

The impact to the environment is expected to be both beneficial and long-term. A short-term adverse impact on water quality is expected during construction. A 310 permit and 3A authorization would likely be required because of temporary water quality exceedances. The environment assessment conducted by USFS would identify appropriate measures to avoid or mitigate problems associated with construction activities. Heritage resource clearance would be completed with the State Historic Preservation Office before construction start-up. Erosion protection measures would need to be undertaken after construction in order to allow vegetation to become reestablished. Stabilization of this drainage would result in improved long-term water quality and improved fish habitat.

**Public Benefits Assessment**

This project would improve water quality, restore riparian vegetation, and remove heavy metals from the Little Blackfoot watershed. Removing the source of heavy metal contamination at the headwaters of the Little Blackfoot River would help to restore and protect resources downstream from the site. This project would complement the restoration work already underway in the Little Blackfoot with the reclamation of the Charter Oak Mine and Millsite.

The county; USFS; Montana Department of Fish, Wildlife and Parks (DFWP); and U.S. Fish and Wildlife Service (USFWS) are all concerned with the aquatic health of the Little Blackfoot. Bull trout (an endangered species) and westslope cutthroat trout (a sensitive species) can both be found in the Little Blackfoot River. Heavy metal concentrations in the bed sediments are suppressing populations and distributions of both species in the drainage. Reclamation of this area would greatly reduce the risk to public health and safety to people who live and recreate in the vicinity.

This project would improve water quality and protect human health and safety, making the Little Blackfoot a more desirable place to both recreate and live. Businesses that would benefit from an increase in the number of people coming to this part of Montana would be homebuilders, storeowners, motels, restaurants, and other service industries. Reclamation contractors and suppliers would experience moderate economic benefit.

**Recommendation**

This project is not recommended for funding.

| | | |
|---|---|---|
| **Applicant Name** | University of Montana | |
| **Project Name** | Recovery of Metals and Remediation of Hazardous Mine Wastes | |
| **Amount Requested** | $ 300,000 | |
| **Other Funding Sources** | $ 182,340 | Applicant |
| | $ 100 | Graymont Western U.S., Inc. |
| **Total Project Cost** | $ 482,440 | |
| **Amount Recommended** | $ 0 | |

**Project Abstract** (prepared and submitted by the applicant)

Presumptive remedies for principal threat metals in soil waste have been defined by the U.S. Environmental Protection Agency (EPA 1999). These remedies include (1) reclamation/recovery, and (2) immobilization. The Clark Fork Superfund complex and the Berkeley Pit in particular can be considered a principal threat in that contaminants are mobile. Contamination of the Milltown drinking water aquifer has previously been reported (Woosner et al. 1984). Hundreds of private or abandoned mine sites within the state of Montana contaminate groundwater, surface waters, and sediments with acid mine drainage (AMD).

We propose to further develop our recovery and immobilization technology at a pilot scale. Our focus would be to implement novel, proactive treatment processes to mitigate disturbed areas, and to enhance sustainable mining practices. The goals of this 20-month project are:

- To further develop materials and methods to extract valuable natural resources in an economically feasible manner
- To develop and/or improve sulfate removal and metal immobilization via microbial sulfate reduction (MSR)

We propose the utilization and further development of silica-polyamine-based technology to recover specific metal contaminants from AMD sites, Milltown Dam sediments and tailings, Berkeley Pit water, and the Horseshoe Bend drainage on a bench scale. The proposed pilot-scale operation may well fully mitigate a selected site or sites (disturbed areas). Additionally, this would provide reasonable estimates of larger scale treatment.

Metal recovery materials developed at The University of Montana in collaboration with Purity Systems, Inc. (US Patents # 5,695,882 and #5,997,748; third patent pending) have been shown to separate and concentrate copper, zinc, manganese, and aluminum from the Berkeley Pit located in Butte, Montana. Removal of low-level cadmium has been shown as well. Acceptable mitigation would include utilization of these proven materials along with our more recently developed or developing composites, followed by pH adjustment or treatment preceding MSR. Research at The University of Montana in collaboration with industrial sponsors would explore novel treatment and augmentation of MSR substrates to significantly improve the efficiency and capacity of sulfate reduction bioreactors.

**Technical Assessment**

The applicant lists the following three project goals:

1. Remove and recover selected metals from contaminated sediments/tailings, Berkeley Pit water, and the Horseshoe Bend drainage at laboratory bench-scale.
2. Immobilize remaining toxic heavy metals from selected metal recovery waste streams by microbial sulfate reduction at laboratory bench-scale.
3. Implement a field pilot-scale treatment process (compiling goals #1 and #2) at Milltown Reservoir or in the Philipsburg Mine District.

Generally, the proposal is hard to follow. While some of the concepts are excellent, project goals need to be further developed and linked to clear and concise project objectives. The tasks proposed are not clearly stated,

and raise as many new questions as they present answers. Some comments and suggestions by RDGP reviewers follow.

1. The Mine Waste Technology Program (MWTP) at Montana Tech in Butte has involved itself in the development of similar technologies costing millions of dollars. The link between the current request and MWTP needs more than just a passing mention.
2. The overall design lacks a control to which the results would be compared.
3. It would be difficult to obtain and receive approval for a field site for the pilot project in the time frames proposed.
4. A mass balance for the entire project should be included. The proposal touts the economic benefit of metal recovery, but does not address the waste stream. How much alkaline material would be required to neutralize all the added $H^+$? What would be the state of leached sediment after revegetation?
5. Many legal and administrative hurdles exist beyond the scientific plausibility of the technical design. The technology would not be brought to commercialization by the research. Since a private company stands to benefit from this research, arguably it should fund the technology development.
6. The proposal did not explain where 99% of the material treated (contaminated sediment with the metals removed) would be disposed of after the treatment.
7. Work done previously at the Berkeley Pit by MWTP appears to significantly overlap the proposed project.
8. How would the systems handle lead, cadmium, and mercury? Once the copper, arsenic, and zinc are extracted, what would be done with the metals and arsenic? Where would they be disposed?
9. Alternatives to the project were not adequately discussed in terms of cost and effectiveness.

RDGP contact with DEQ indicates that it does not see any urgency for this type of project in its cleanup schemes for abandoned mines. While eventual commercialization of the proposed technology may have widespread application in the mine reclamation field, at this stage it is not a high priority for RDGP funds expenditure.

**Financial Assessment**

The total overall budget for this project consists of the following:

| | RDGP | Matching Funds | Total |
|---|---|---|---|
| Salaries and Wages | $ 112,000 | $ 96,000 | $ 208,000 |
| Employee Benefits | $ 22,480 | $ 13,140 | $ 35,620 |
| Contracted Services | $ 40,000 | $ 0 | $ 40,000 |
| Supplies and Materials | $ 38,000 | $ 10,100 | $ 48,100 |
| Communications | $ 2,000 | $ 0 | $ 2,000 |
| Travel | $ 9,000 | $ 0 | $ 9,000 |
| Rent and Utilities | $ 0 | $ 43,200 | $ 43,200 |
| Equipment | $ 75,000 | $ 20,000 | $ 95,000 |
| Miscellaneous | $ 1,520 | $ 0 | $ 1,520 |
| **Total** | **$ 300,000** | **$ 182,440** | **$ 482,440** |

Because the project would be devoted to research, the costs presented are difficult to evaluate. It would require millions of dollars to bring this technology to commercialization. The proposed areas of concern could be remediated by ARCO (the responsible party), EPA, and DEQ using conventional technologies costing much less.

**Environmental Evaluation**

Implementing a pilot plant treatment process, as proposed for Milltown Reservoir, would entail preparation of an environmental assessment by EPA. Any pilot plant location would require EPA or DEQ approval and, thus, appropriate safeguards protecting the environment from adverse impacts.

**Public Benefits Assessment**

Presently, the predicted public benefits are hard to quantify. They could be significant if a low cost metal recovery/removal process eventually has widespread application to the cleanup of Montana mines. On the other hand, the proposed technology might not work as predicted and require further refinement. It would appear that private enterprise stands to benefit the most by the RDGP funding, in that company savings of R&D dollars would be a major outcome.

**Recommendation**

This project is not recommended for funding.

| | | |
|---|---|---|
| **Applicant Name** | Whitefish, City of | |
| **Project Name** | Reclamation of Pre-1971 Opencut Mining Disturbance in Whitefish Gravel Pit | |
| **Amount Requested** | $ 300,000 | |
| **Other Funding Sources** | $ 209,000 | Applicant |
| **Total Project Cost** | $ 509,000 | |
| **Amount Recommended** | $ 0 | |

**Project Abstract** (prepared and submitted by applicant)

The City of Whitefish is applying for a Reclamation and Development Grant to help reclaim and redevelop a portion of the Whitefish gravel pit that was disturbed prior to the passage and authorization of the 1971 Opencut Mining Act (Title 82, Chapter 4, Part 4, MCA). The Whitefish gravel pit, also known as the Stoner Pit, is located on the southern edge of Whitefish.

The Whitefish (Stoner) gravel pit has been used for sand and gravel mining for over 40 years. A review of aerial photographs taken by the Montana Department of Transportation (MDT) and archived on tapes, in its aerial photograph laboratory in Helena, identified a 1961 image that shows gravel-mining disturbance in the area. Use of the Stoner gravel pit continued by various parties during these early, pre-1971 periods, but most of the mining activities at the site ultimately came under MDT's operations in the mid 1970s. On March 23, 1990, MDT began the process of applying for a Mined Land Reclamation Contract with the Montana Department of State Lands' Opencut Mine Bureau (which subsequently became part of DEQ) for the Whitefish (Stoner) gravel pit. After several submittals, MDT's contract was approved for mining on about 15 acres on January 21, 1993.

In May 1999, the City of Whitefish acquired the property from MDT in a land exchange for a 5-acre parcel of land located southeast of the city, where MDT had plans to construct a new highway field-maintenance facility. The city acquired 15.27 acres of the area owned by MDT while MDT retained ownership of approximately 3.16 acres in the southeast corner of the site designated for use as a storm water retention pond. Out of the 15.27 acres acquired by the city in this land exchange, at least 5 acres mined prior to the passage of the 1971 Opencut Mining Act remain unreclaimed. Therefore, the city is requesting that grant monies be used for the reclamation and development of the 5-acre, pre-1971 opencut-mined portion of the Whitefish (Stoner) gravel pit.

The proposed reclamation and development alternatives include (1) regrading approximately 5 acres of pre-1971 opencut mining disturbance to blend with the remaining portion of the property, (2) synthesizing cover soil materials, (3) salvaging and trading for native soils within nearby areas, (4) respreading cover soil over the affected areas, and (5) reseeding the 5-acre site with site-adapted vegetation that will comply with the future use as a business/professional park. The primary objectives of this reclamation project are to design reclamation alternatives and prepare a bid package to solicit bids for the actual reclamation construction activities for the 5-acre site. The city intends ultimately to develop the entire 15.27-acre area into a business/professional park. Therefore, it is prudent and practical that the reclamation efforts for the 5-acre portion conform and be coordinated with the necessary construction work for the remaining approximately 10-acre portion.

**Technical Assessment**

The goal for the proposed reclamation and development project is to reclaim a 5-acre mined portion of the Whitefish (Stoner) gravel pit and develop it into a safe, environmentally sound, and economically viable business/professional park within the City of Whitefish. Additional goals include protecting and preserving valuable topsoil resources and providing an example and standard for reclamation of other gravel mines in the vicinity. Successful reclamation would help minimize infestation and spread of noxious weeds and allow the site to be developed into a business/professional park or other available public space. The applicant lists four separate objectives for the project.

- Recontour and regrade complex geomorphic slopes to provide stable landforms that blend with adjacent slopes
- Identify a party for acquisition and trade of sand and gravel fill material for topsoil that otherwise may be lost or destroyed
- If a willing party for trade cannot be identified, design and construct on-site static piles to synthesize cover soil needed for reclamation
- Prepare detailed reseeding and revegetation plan that includes planting site-adapted, hardy plant species

The applicant has done a good job of addressing reclamation alternatives and construction costs. However, the site is not eligible for RDGP funding. The Montana Department of Environmental Quality has reported to DNRC that the site is permitted to the Montana Department of Transportation. As set forth in Title 90-2-1112(4), MCA, permitted mine sites are ineligible for RDGP funds. The burden of developing this property appears to fall with the city since its acceptance of ownership in 1999. Even if the site were eligible, it would be a low priority for funding.

**Financial Assessment**

The total overall budget for this project consists of the following:

| | RDGP | Matching Funds | Total |
|---|---|---|---|
| Salaries and Wages | $ 4,374 | $ 10,000 | $ 14,374 |
| Contracted Services | $ 293,226 | $ 19,000 | $ 312,226 |
| Miscellaneous | $ 0 | $ 180,000 | $ 180,000 |
| Travel | $ 1,600 | $ 0 | $ 1,600 |
| Rent and Utilities | $ 800 | $ 0 | $ 800 |
| **Total** | **$ 300,000** | **$ 209,000** | **$ 509,000** |

The city lists as part of its match $180,000 it would pay to MDT if the site is sold or leased. Reclamation responsibility and the associated cost are the burden of MDT or the city, whoever holds the permit.

**Environmental Evaluation**

There would be few, if any, long-term impacts to the environment associated with this project. Construction activities and equipment use would disrupt soil, air, and vegetation resources. Noise would be a relatively minor concern, given the site location. All short-term impacts could be easily mitigated.

**Public Benefits Assessment**

By completing reclamation needed to develop a business/professional park near Whitefish, this project could help centralize some development near town and help limit the sprawling development and building outside of town. Centralizing this type of development near town would provide shorter commuting and allow the use of existing city services (e.g., water, wastewater).

The residents of Whitefish would directly benefit from the reclamation of the 5-acre, pre-1971 portion of the gravel pit and from the development of a business/professional park. The reclamation work would convert a currently unsafe and noxious-weed-infested area and develop it into a safe, environmentally sound, and economically viable business/professional park within the City of Whitefish. This reclamation project would provide construction jobs for local workers and make building lots available for commercial development.

**Recommendation**

This project is not recommended for funding.

# CHAPTER III

# STATUS REPORT OF 1997 - 2001 PROJECTS

This chapter briefly summarizes the status (as of October 1, 2002) of active projects that have been completed since preparation of the January 2001 Legislative Report. The projects are grouped according to the year in which they received legislative approval; within each grouping, the projects are presented in the order of their relative funding priority.

## Projects Approved by the 2001 Legislature

### 1. Board of Oil and Gas Conservation / 2001 Eastern District Orphaned Well Plug and Abandonment, and Site Restoration

A contract was signed in November 2001 providing funds for well plugging and abandonment in Petroleum, McCone, Richland, and Roosevelt Counties. Work is proceeding smoothly, and no problems have been encountered. The project should be completed by June 2003.

### 2. Board of Oil and Gas Conservation / 2001 Northern District Orphaned Well Plug and Abandonment, and Site Restoration

A contract was signed in November 2001 providing funds for well plugging and abandonment of 11 wells in Fergus, Hill, and Toole Counties. Work is proceeding smoothly, and no problems have been encountered. The project should be completed by June 2003.

### 3. Department of Environmental Quality / Development of a Trust Fund to Ensure Long-Term Water Treatment at Zortman and Landusky

The agreement between DNRC and DEQ for augmenting the Zortman / Landusky water treatment trust fund was signed on August 6, 2002. In addition to the $300,000 of RGDP funds, DEQ has also received $540,000 of RIT funds to be put toward the purchase of a zero-coupon bond which, when added to the existing trust fund, will result in the fund having a value at maturity (year 2017) of $15 million. As of October 2002, DEQ is still discussing with the Board of Investments whether it is better to purchase the bond now or await more favorable interest rates. The remaining zero-coupon bond will likely be purchased during the fall of 2002.

### 4. Powell County / Ontario Wet Tailings Reclamation

A contract has not been signed for this project. There has been a delay in resolving the final placement of the mine tailings in an off-site repository. The U.S. Forest Service and DEQ are negotiating the terms and conditions of long-term tailings maintenance and liability. It is expected that construction will begin next field season (2003), once these difficulties are overcome.

### 5. Lewistown, City of / Reclamation of Brewery Flats on Big Spring Creek

All the field sampling has been completed on the Brewery Flats site including the Oxbow area. The analysis has been completed for all the field samples with the exception of the Oxbow analysis, which is ongoing. Based on the results of the analysis of the field-collected data, a Voluntary Cleanup Plan will be completed early this winter. A bid package for cleanup will be prepared this winter also, with the project expected to be bid by next May.

Substantial progress has been made in removing the surface debris. A start has been made on removing the railroad ties to a landfill near Great Falls. The two dwelling units on the site are also gone. A lot of volunteer effort has been expended on the surface cleanup this fall. The project should be completed in fall 2003.

### 6. Department of Environmental Quality / CMC Pony Mill Site Reclamation Project (Completion Phase)

Grant funds were used for the recontouring of 70,000 cubic yards of earth material, topsoiling, and revegetation. The site is located adjacent to the community of Pony, Montana. All work has been satisfactorily completed.

### 7. Broadwater Conservation District / Big Belt Mine Reclamation Project

Final design and construction of this project have not been completed. Currently, the grantee and the U.S. Forest Service are in the process of preparing final bid documents to reclaim portions of placer mine sites located in Avalanche, Confederate, Hellgate, and Magpie Gulches, just east of Canyon Ferry Lake. Work is expected to be bid in early 2003 and construction completed during the summer of 2003.

### 8. Deer Lodge, City of / Former Chicago, Milwaukee Railroad Passenger Fueling Area

A memorandum of agreement was executed in September 2002 between the City of Deer Lodge and the Montana Department of Environmental Quality (DEQ) to reimburse DEQ for the cost of providing oversight on the proposed interim remedial actions at the site. A project kickoff meeting and site inspection were held on September 25, 2002. A draft work plan was submitted to DEQ and the City of Deer Lodge for review on October 15, 2002. Pending approval by DEQ, a final work plan will be submitted, and subcontracting will be initiated. Site construction activities are anticipated to commence in November 2002 and be completed in December 2002. The project final report is anticipated for completion in February 2003.

### 9. Butte-Silver Bow County / Upper Clark Fork Basin; Superfund Technical Assistance

This grant provides funding to assist the communities of Anaconda, Butte, and Deer Lodge, and Granite County in the design, review, and public information effort associated with Superfund activities in the Clark Fork River Basin. As of October 2002, a contract had not been signed. There are still funds remaining from a previous RDGP Grant to Butte-Silver Bow Local Government for the same project (see write-up number 5, **on page xxxx** – in the section called Projects Approved by the 1999 Legislature).

### 10. Board of Oil and Gas Conservation / 2001 Southern District Orphaned Well Plug and Abandonment, and Site Restoration

A contract was signed in November 2001 providing funds for plugging and abandonment of 11 wells in Musselshell, Petroleum, Sweet Grass, and Yellowstone Counties. Work is proceeding smoothly, and no problems have been encountered. The project should be completed by June 2003.

### 11. Custer County Conservation District / Yellowstone River Resource Conservation Project

A $299,977 grant was authorized by the 2001 Legislature, and a grant agreement was executed in September 2001. A total of $6,462 has been disbursed. Initial inventories have been completed, including rapid aerial assessments, from the Park County-Sweet Grass County border to the Montana-North Dakota line. Agreements (for cost share) with the U.S. Army Corps of Engineers are in the final stages of negotiation. Resource and technical advisory committees have been formed and operate under the auspices of the Yellowstone River Conservation District Council. The project is scheduled for completion in April, 2004.

### 12. Cascade County / Fort Shaw Weed Shop Soil Contamination Remediation

This project has been completed. The county removed and transported contaminated soils to an out-of-state hazardous waste disposal facility. The project was completed under budget, and $47,875 of the $218,466 appropriated for the project was returned to RDGP.

### 13. Department of Environmental Quality / Organic Soil Amendments

DEQ has consulted with several soil scientists and compost suppliers regarding the proposed amendment of cover soils at the Zortman and Landusky Mines. DEQ has also extensively evaluated which areas of the mine sites have the greatest need for organic amendment, as well as the quality and quantity of organic amendment

needed. A grant agreement has been drafted. As of October 2002, DEQ is considering entering into a sole source agreement with the bankruptcy trustee for Berg Lumber of Lewistown. A large sawdust pile must be removed from this facility as part of its closure, and this sawdust could be converted into compost and trucked to the Zortman and Landusky Mines far more cheaply than compost would be purchased and shipped to Zortman from the next nearest suppliers in Montana. Because this would allow a larger quantity of compost to be acquired for the project, more acres could be amended, or the prioritized areas could receive a thicker application of compost. Use of the Berg Lumber sawdust stockpile in Lewistown for this project would also assist with the environmental remediation of that bankrupt facility. DEQ's plans for acquisition of compost for this RGDP-funded project will be finalized during the fall of 2002 and implemented during the winter and spring of 2003.

**14. Department of Environmental Quality / Zortman Mine - Ruby Gulch Tailings Removal**

In January 2001, the legislature required that BLM contribute matching funds to assist with the Ruby Gulch tailings removal project. The existing BLM grant to DEQ for assistance with the Zortman project was amended on June 27, 2001, adding Task Order #3 ($300,000 for removal of tailings from Ruby Gulch).

On September 25, 2001, an existing contract for reclamation of the Zortman Mine was modified by DEQ to include the removal of 30,000 cubic yards of tailings from near the Zortman townsite and 20,000 cubic yards (cy) of tailings previously stockpiled by Pegasus Gold near the headwaters of Ruby Gulch. These tailings were transported to the Zortman Mine pit for use as a cushion layer over the liner covering the backfilled pit. This change order ($280,000) was funded via the mine reclamation bond.

In November 2001, DEQ released an Invitation for Bid for the Ruby Gulch tailings removal project. The bid package involved complete removal of tailings beginning approximately 3,000 feet upstream of the town of Zortman, continuing through the town of Zortman, and ending approximately 2,000 feet downstream of the townsite. The estimated volume of tailings to be removed was 84,840 cy. Installation of stream crossings for streets within the town, and sediment traps upstream of the town, was also included in the bid package. The plan was designed to comply with the legislature's requirements for the project and to fit within the available funding ($600,000). Bids were opened on December 17, 2001, and the low bid was $198,951.20. The contract was awarded on December 31, 2001, and the Notice to Proceed was accepted on January 22, 2002. The contract was amended on February 8, 2002 to allow the removal of an additional 20,000 cy of tailings for $28,900.

The Grant Agreement between DEQ and DNRC was signed on February 25, 2002. The project was then expanded to include removal of additional tailings farther up Ruby Gulch. A second change order was issued in March for the removal of an additional 97,000 cy for $206,740. In May 2002, BLM amended its grant to DEQ by $200,000. Another change order was then authorized, allowing the removal of an additional 110,000 cy of tailings for $246,143. In September 2002, BLM awarded DEQ $200,000 more for completion of the Ruby Gulch tailings removal project. It is now anticipated that all historical mill tailings within Ruby Gulch will have been either transported to the Zortman Mine for use as subsoil or pit backfill, or will be stabilized in place, by January 2003.

All work described within the original bid package has been satisfactorily completed. The reconstructed channel and bridges survived a major precipitation event during August 2002 without significant erosion or flooding within the town of Zortman. The primary goal of this project was the prevention of flooding within the town of Zortman during storm events such as the one that occurred on August 6, 2002.

**15. Department of Environmental Quality / Coal Bed Methane Gas EIS**

This grant provides funds to complete an environmental impact statement (EIS) for coal bed methane development in Montana. The Montana Board of Oil and Gas Conservation and the U.S. Bureau of Land Management are co-project participants. A draft EIS, public hearings, and the comment period have been completed. The final EIS is scheduled for January 2003.

**16. Glacier County / 2000 Glacier County Plugging and Abandonment Aid to Independent Operators**

This grant provides funds to cost-share with small, independent oil and gas operators the cost of plugging and abandoning orphaned wells. The project is progressing slowly because of the lack of participating small operators. Several options for increased participation are now being pursued.

### 17. Pondera County / Oil and Gas Well Plug and Abandonment Project

This grant provides funds to cost-share with small, independent oil and gas operators the cost of plugging and abandoning orphaned wells. The project is progressing slowly because of the lack of participating small operators. Several options for increased participation are now being pursued.

## Projects Approved by the 1999 Legislature

### 1. Board of Oil and Gas Conservation / "A" Orphaned Well Plug and Abandonment

BOGC has bid the project and has satisfactorily plugged 10 wells located in Glacier County. A total of $300,000 was authorized for this project.

### 2. Board of Oil and Gas Conservation / "B" Orphaned Well Plug and Abandonment

Four wells in Toole and Pondera Counties have been plugged. Plans and specifications are being prepared for the plugging of wells located in Petroleum and Stillwater Counties. A total of $300,000 was authorized for this project.

### 3. Park Conservation District / Upper Yellowstone River Cumulative Effects Investigation

A $299,940 grant was authorized by the 1999 Legislature. A $299,443 grant agreement was executed in October 1999. A total of $275,293 in grant funds has been disbursed. Funds are being used for geomorphology, hydraulic, and riparian studies from Gardiner to Springdale. The overall goal behind this data-gathering effort is for the Governor's Upper Yellowstone River Task Force to use the information gathered by the studies to develop a set of publicly supported river corridor management recommendations that address potential adverse cumulative effects of river channel modification and floodplain development on the human community and riparian ecosystem. The overall project is nearly complete.

### 4. Toole County / Plug and Abandonment, Aid to Independent Small Operators

Under this project, the cost of plugging oil and gas wells was cost-shared with independent small operators. A total of 209 wells were plugged. The project is complete.

### 5. Butte-Silver Bow Local Government / Upper Clark Fork Basin: Superfund Technical Assistance

The technical specialist hired under this project has continued to assist the local governments of Silver Bow, Deer Lodge, Powell, and Granite Counties, providing technical guidance and expertise on various Superfund projects. In the period ending September 2002, the assistance was significant on several key projects, including the remediation work ongoing on the Silver Bow Creek and Berkeley Pit cleanups, and the pending clean-up decision process for the Clark Fork River and Butte Priority Soils Operable Units. In addition, the technical specialist has provided input on county projects proposed under the Natural Resource Damage Program. The expertise and assistance that the technical specialist brings to the local governments on these technical issues have proven very beneficial and will remain critical over the next few years as the region's final Superfund decisions are made.

### 6. Fergus County Conservation District / Central Montana Artesian Basin Groundwater Project

The project has been contracted, and plans are being formulated to conduct plugging of artesian wells in the fall of 2002. A total of $150,000 was authorized for this project.

### 7. Toole County / North Toole County Reclamation Project

This project, which involved surface cleanup and reclamation of oil and gas sites in Toole County, is complete. The grantee prepared a reclamation handbook describing recommended procedures that can be used at similar sites statewide. A total of $150,000 was authorized for this project.

### 8. Butte-Silver Bow Local Government / Mining City Mineyard Preservation and Enhancement

A $297,104 grant was authorized by the 1999 Legislature. A grant agreement was executed in September 2000. A total of $90,701 in grant funds has been disbursed. This project is part of the overall development of a Mining Heritage Park in Butte. This project has four main goals: (1) maintain and maximize the safety of 10 existing headframes, (2) restore partial function to the Steward headframe, (3) gain down-shaft access to the Steward shaft, and (4) establish an experience-based education program that will provide an ongoing capability to maintain and enhance Butte's headframes. Half of the Steward headframe tasks have been completed.

### 9. Townsend, City of / East Pacific Mine Reclamation

The project has not been contracted and is awaiting go-ahead notification from DEQ. DEQ is planning reclamation at the site using federal funds. The two entities would cost share the total cleanup of the hard rock mine site. A total of $203,500 was authorized for this project.

### 10. Lewistown, City of / Source Location of Hazardous Organic Contaminants, Big Spring Creek Drainage

The project, which involved soil and water sampling in the area of Brewery Flats, Lewistown, has been completed. The area is heavily contaminated with petroleum residue and potentially PCBs and heavy metals. The test results are being used to develop a remedial cleanup plan for the site located adjacent to Big Spring Creek. A total of $50,000 was authorized for the project.

### 11. Glasgow Irrigation District / St. Mary Diversion Repairs

The U.S. Bureau of Reclamation completed the design of the cathodic protection, and installation of the system began in September 2000. The design and repair of the siphons began in the winter of 2000, with completion of the project scheduled for October 2002.

### 12. Board of Oil and Gas Conservation / Oil Well Abandonment

The project has been completed. Funding was used to help offset plugging costs of an oil and gas well located in Musselshell County. A total of $20,105 was authorized for this project.

## Projects Approved by the 1997 Legislature

### 1. Department of Natural Resources and Conservation / Reliance Refinery Soils and Sludge Cleanup

A cleanup plan for this site, located in Kalispell, has not been finalized. Project implementation is complicated by the existence of potentially liable persons (PLPs) on adjacent lands. The Department of Environmental Quality has notified the PLPs that additional remedial actions are required before DEQ will approve a final cleanup plan. The RDGP funds were reappropriated by the August 2002 Special Legislative Session.

### 2. Butte-Silver Bow Local Government / Mine Subsidence Reclamation

Over the past two years, the project sponsor has completed research, collected data, and acquired underground mining records with matching funds (under a separate EPA grant). This work has been instrumental in the effort to address many of Butte's most critical subsidence problems. With the analyses complete, the project sponsor is prepared to fix, by the end of October 2002, several high priority subsidences, mostly in residential settings. With the acquisition of additional underground mining records in the summer of 2002, and based on the fieldwork scheduled for completion in 2002, the project sponsor expects to expend all grant funds by the end of the 2003 construction season.

2003

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